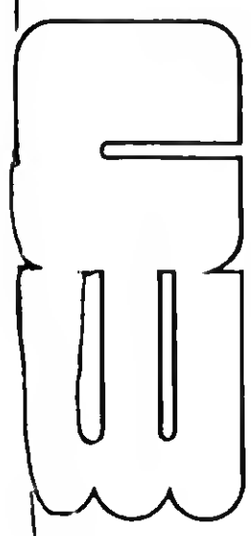
VOL 9



Language Accommodates Privacy Laws

By Nancy French
Of the CW Staff

CAMBRIDGE, Mass. – Users faced with rewriting source code to make programs comply with the Privacy Act of 1974 may wish to consider using the high-level Privacy Language and a preprocessor under development here.

These tools allow a user to modify any program written in a conventional language such as Cobol by coding the privacy functions in Privacy Language, running the program through a preprocessor to expand the instructions and then compiling as usual.

Separating the privacy aspects of a program from its functional aspects in this way allows the user to "change and modify the privacy module as the law evolves and develops without ever touching the functional code," Robert Goldberg, who conceived the system, said.

Goldberg, who is a lecturer on computer science at Harvard's Aiken Computer Computation Laboratory, contends relatively simple and efficient privacy coding is needed to avoid the type of partial solutions some users are adopting to comply with amendments to the Fair Credit Reporting Act.

"Rather than actually correcting computerized records that have been disputed, some credit bureaus are merely flagging them and maintaining the new information in a separate file – perhaps on 3 in. by 5 in. cards," he explained. While this fulfills "the language of the law, it works to the disadvantage of the individual whose record is disputed by increasing the turnaround time the credit agency needs to respond to an inquiry."

If a credit agency employee can call up all the information needed for a credit inquiry from a single source such as a CRT screen or a computer printout, the agency can provide a couple of seconds response time on that inquiry, he explained.

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NEWSPAPER

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Xerox Issues Statement on Phaseout to Users

By Nancy French
Of the CW Staff

EL SEGUNDO, Calif. – In response to user pressure, Xerox issued a lengthy statement last week telling customers what they could expect during the phaseout of its computer operations.

The firm agreed to extend the cutoff date for guaranteeing to fill orders for add-on equipment and spare parts from Oct. 1 to Dec. 31, but did not budge on its earlier request for all mainframe orders by Oct. 1. Orders received after those dates will be filled only if equipment is available, according to the statement signed by Xerox Corp.'s Data Systems Division President Jack C. Lewis.

The firm noted its Model 3010 terminal, manufactured by its subsidiary, Diablo Systems, will be available indefinitely.

The company said it will announce only four more software releases – the D00 release of CP-V late this year, as scheduled; ANS-75 Fortran; the B00 release of Text; and software to enable the IBM 3780 to function as a front-end communications processor under CP-V – all in mid-1976 as promised.

The firm has decided not to release the multiprocessing capability which was to have been provided for the 560 system, nor will it develop Cobol beyond the E05 release dated last July. Both these announcements come as a special disappointment to users who were counting on their 560s and a more extended Cobol for multiprocessing activities scheduled down the road, according to Bill McAlpin, chairman of the Xerox user's group known as "exchange."

Service Continues

Xerox said it intends to service equipment, including the 9 series, through July 21, 1982, "if contracted to do so. We will continue to negotiate maintenance agreements limited only by our ability to serve specific locations, and that applies to both lease and purchase customers," the statement said.

McAlpin said the company's terms are "pretty good under the circumstances."

But some found the answers to the Exchange group questions, prepared at its August meeting here, terse and carefully

(Continued on Page 2)

Flaw Causes $10 Million Welfare Error

By Edith Holmes
Of the CW Staff

WOODLAWN, Md. – In a single day last month a programming error resulted in $10,516,000 in overpayments to Welfare recipients, bringing overpayments in the new federal Welfare program for the nation's aged, blind and disabled to over $403 million in its first 18 months of operation.

Last week President Ford asked the Office of Management and Budget to review the matter and to make sure such overspending "won't be done again."

The $10 million in overpayments went to about 15,000 people covered by Supplemental Security Income (SSI), a program initiated Jan. 1, 1974. A number of massive SSI checks, many of them running over $1,000, caused personnel at the Social Security's Bureau of Data Processing here to search for some error.

The error was eventually traced to a faulty program instructing an IBM 370/165 and a -168 to issue checks to people as though they had been underpaid for a year, according to a spokesman for the bureau.

When asked about the nature of the programming mistake, he responded, "Under certain conditions, some strings of instructions – just a few out of hundreds and thousands of instructions for issuing checks – won't be valid. We must have hit some of those conditions." Though designated spokesman for the Social Security Administration's (SSA) DP operation, he said he wasn't close enough to the problem to comment more specifically on what went wrong.

The SSA chased the checks with mailed notices to recipients telling them that they had been overpaid and that SSA would like the money returned, according to Robert P. Bynum, the SSA associate commissioner for program operations, including SSI.

"We did have the system under pretty

(Continued on Page 3)

White House Still Dragging Feet On Appointing EFTS Commission

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – By the end of August – 10 months after legislation calling for a two-year National Commission on Electronic Funds Transfer was signed by President Ford [CW, Nov. 27] and

Analysis

only two months before its interim report is due – the commission had not yet been named.

That paragraph appeared in *Computerworld* four months ago [CW, May 7]. Only the month, the elapsed time and the time remaining before the first report is due have been changed. The situation hasn't.

Thus far, the five commission members supposed to come from the private, nonfinancial public simply have not been named. And the commission chairman, expected to be drawn from these "public members," is also unnamed.

As of last Wednesday, a source at the White House press office admitted having had "a lot of calls on it here and there" but added, "We have nothing on it at this time . . . not even any paperwork, which leads me to believe it's pretty far down the pike yet."

In fact, much of the commission membership is prescribed by law. The enabling legislation provided initial funding that would have allowed some staffing to gather data even before the commission is formally convened.

But, the press office explained, naming of a commission staff is usually done by

(Continued on Page 4)

Info 75 Courts End User

NEW YORK – Designed for end users, Info 75 will stress the applications, rather than the technology, of information systems for an expected crowd of 12,000 next week.

The conference, which opens here Monday, Sept. 8, and is scheduled to run through Thursday Sept. 11, will also hold a number of technological sessions for DP managers and others with the background to understand them.

But this year's Info is aimed chiefly at showing corporate and DP managers "how they can work together to develop new and useful information systems that will increase efficiency and reduce costs," a spokesman for Clapp & Poliak, Inc. Management, which sponsors the conference, said.

More than 300 speakers, panelists and session leaders will address Info's 100 sessions. Running concurrently with the conference will be an exposition with 125 exhibitors in 240 booths.

The sessions are organized into four key areas: industrial, functional, DP management and technology and minicomputers in business. These four areas constitute "conferences-within-a-conference," according to the spokesman.

For example, there is a conference-within-a-conference for seven major in-

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Result of User Pressure

Xerox Issues Statement on Phaseout

(Continued from Page 1)

worded. Even a close reading leaves many questions still unanswered, one source said.

Throughout, the document emphasized "fulfilling contractual responsibilities," but not a great deal more.

Xerox emphasized that contract questions had to be dealt with "on a case-by-case basis," since lease arrangements varied widely, and warned that a new lease would not necessarily contain the same terms.

The company's answer to the renewal question said only, "upon expiration of an existing lease, customers may execute a new lease with Xerox."

As for upgrading mainframes on existing lease, Xerox said its present policy would not change, indicating such upgrades would depend on availability of equipment and ability to "facilitate" maintenance.

On the conditions under which a customer may cancel ordered but unshipped equipment, Xerox said, again, each case is "unique" and "will be evaluated accordingly." The firm added they have no plans to initiate any more favorable lease-to-purchase terms for present lease customers.

Users were told delivery priority would continue to be based on the date of an order. The firm agreed, however, that if a user wished to place an order but not take delivery for an extended period of time, Xerox would build and invoice the equipment and charge a fee for warehousing and retesting.

As for equipment presently on order, Xerox assured there would be no slippage in delivery, promising to "continue to meet our existing standards of test and integration."

After Xerox inventory is depleted, the firm said it will arrange for users to "acquire spares and products from the firm's subcontractors who manufacture such equipment."

Custom systems such as the Communications Input/Output Controller (CIOP) will continue to be provided with the same "availability" condition planned for add-on products following Dec. 31.

Software Design Requests

Xerox has agreed to continue to process software improvement design requests "for the period of its contractual commitment" which could be "up to seven years on some specific maintenance agreements." It would appear some users would be cut off earlier than others, a source said.

As for acquiring rights to Xerox proprietary software, the firm has announced this is "subject to negotiation" and will be handled in the same manner as comparable requests for hardware rights.

Xerox will continue to help customers modify software "subject to availability of skills" and will accept formal contracts for modification and enhancements on the same basis, the document said. Finally, the firm will give the user group's library all software still in the development stages "as is."

Xerox has promised to train users to maintain their own systems to the extent they have the staff to do so.

Xerox agreed to complete and make available documentation for all systems, including the newer 550 and 560 series equipment.

Xerox also agreed to continue to update and correct documentation. But the firm has never supplied nor does it plan to supply users with such performance data as mean time between failure or mean time to repair as a planning aid.

When Xerox documentation runs out, users may reproduce it.

Finally, the firm said it will continue to honor its contractual service commitments in the area of response time and remote assists, for example.

Tool Accommodates Privacy Laws

(Continued from Page 1)

"If, however, the file is flagged as disputed, and the information needed to fulfill a request for information is on hard copy in a remote file room, the credit agency may require as many as seven days to respond.

"This certainly penalizes the individual who has disputed his record and would seem to violate at least the spirit of the law," Goldberg said.

One reason for the delay users have seen in developing file designs that meet the requirements of privacy laws is computer experts traditionally have been more interested in security than privacy, Goldberg said.

The so-called "spook" agencies have developed very successful encryption algorithms and other security measures but "have never really had to confront the disclosure problem," he said.

Data Manipulation Verbs

Goldberg's Privacy Language consists of data manipulation verbs that enable a user to record disputed data and corrections requested by individuals as provided by the law. The data manipulation verbs include such commands as LOG, GET-comments, STORE-subject-comment and STORE-pers-correction, for example.

The verbs are patterned directly from the language of the law, Goldberg explained. For example, the LOG verb needs "the date, nature and purpose" of a disclosure to create a new LOG record.

Expansion of certain privacy-oriented verbs requires a considerable amount of detailed processing, he said. For example, under current legislation, the STORE-pers-correction verb must be able to search the LOG set for data indicating when erroneous information may have been disseminated to other agencies and then internally invoke TRANSMIT-pers-record, for example, to apprise those agencies of the correction.

DELETE-pers, for example, must not only delete a personal record, it also should be able to delete all LOG records owned by that record that are more than five years old. Under the law, these LOG records must contain data indicating who, outside those with a need to know in the principal user agency, has accessed those records; when; and for what purpose.

Use of a higher level Privacy Language should improve the productivity of designers and programmers who are building personal information systems, Goldberg said.

In addition, since the same verbs will always be used to express the same functions, regardless of the programming language or the application, this approach vastly simplifies documentation and maintenance.

The preprocessor that translates Privacy Language verbs into the user's normal programming language statements may be used by a variety of agencies since privacy considerations are largely agency and system independent, he said.

Further, providing the Privacy Language is written properly, it "may be possible" to implement changes in the law by simply altering the preprocessor, "thus providing whatever new expansion is needed for a particular verb," he said. Then, "a common utility program could be used to alter the data base to support the new expansions."

Goldberg will speak on this subject before members of the Institute of Electrical and Electronics Engineers at their meeting at Washington, D.C.'s Mayflower Hotel on Sept. 9.

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Politics, Controversy Put End to Dial-A-Ride System

By Catherine Arnst
Of the CW Staff

SAN JOSE, Calif. – Political expediency and public controversy here marked the end of a computerized public transportation system whose major fault was that it was too popular.

Dial-a-Ride, a personalized door-to-door rapid transit system serving Santa Clara County, opened Nov. 24, 1974 and closed May 9 because it attracted more riders than it was originally designed to handle. Officials had anticipated that in 18 to 24 months the systems would carry 10,000 passengers per day on 90 buses; instead, within 90 days, it was carrying 7,000 passengers per day on 40 buses.

Service became backlogged and inefficient, the county was saddled with labor disputes and lawsuits, and additional funds were nonexistent. The County Board of Supervisors reacted to these problems by voting to discontinue the service, an action termed a 'political move' by one transit official who felt local politicians didn't give the system a chance.

It took about a year for Lex Systems, Inc. to design Dial-a-Ride for the county. They based it on a similar manual system previously tested in Haddenfield, N.J.

Santa Clara's Dial-a-Ride ran on three leased Four-Phase Systems, Inc. Model 70s. The 240-square-mile county was divided into 18 service areas which were in turn sectioned off into 20 to 30 zones each.

When a phone call came in with a request for service, the address was keyed into a particular zone. The computer was programmed to scan the available buses, assign the trip to a bus in the area and calculate the time of pickup, which was passed on to the caller.

Each bus driver would call in after an assigned pickup was made. This information was keyed into the computer, erasing the assignment.

Dial-a-Ride has been tried manually in several cities on a smaller scale, but it is the type of system that "works" better as it gets bigger," according to Dr. Roy Murphy of Lex. With Dial-a-Ride, when the service grows beyond six vehicles, a computer is justified financially, and beyond 10 vehicles, it is justified statistically, Murphy said.

Reliable System

There were no mechanical problems with Dial-a-Ride such as have plagued the infamous Bay Area Rapid Transit (Bart) system in San Francisco, and Murphy said he has "never worked with a more reliable system."

The problems with Dial-a-Ride were due primarily to the overwhelming demand from the day it started. Phone lines were clogged, with callers waiting hours to get through. This was solved with the addition of more operators and hardware to handle the calls, but there still remained the task of providing pickups for all the riders requesting one. There were not enough buses to pick up each passenger promptly, and there was sometimes a several-hour wait instead of the few minutes expected.

When Dial-a-Ride opened, several fixed arterial routes were closed. The protests from displaced riders, who claimed Dial-a-Ride did not adequately serve them, never ceased.

Also, the buses used in Dial-a-Ride were the same buses employed in some of the fixed arterial routes, and these buses were pulled off the personalized system during peak hours on the arterial. Consequently, there was no real door-to-door service provided during peak hours.

Public Image Suffered

Because the same size buses were used for both the fixed routes and Dial-a-Ride, the service's public image suffered. The large buses often seemd to be empty or nearly empty when used in the personalized service, and the public complained they were underutilized.

These unfilled buses were cost-justified because, rather than sitting idle in a garage as they do in the fixed routes, they were always on the road looking for passengers, argued Frank Lara, transit marketing officer of the County of Santa Clara.

The final blow was a suit brought by the county's eight taxicab companies charging the service was unfair competition in violation of the County Transit District Act. A superior court judge ruled in their favor and ordered the county to buy the taxi companies.

High Cost

This would have added several million dollars to a system already running at an increasingly larger deficit. A state legislator had already blasted the high cost of Dial-a-Ride – the cost is $4.85 per passenger, as opposed to $.57 per passenger on fixed arterial routes – which was partly financed by state funds.

A study commissioned by the Board of Supervisors concluded that Dial-a-Ride "can work if you're willing to pay the price to make it work." The Board decided the price was already too high and voted to discontinue it.

Lara disagreed with this decision. "It was a political move by the Board of Supervisors. They were getting a lot of heat, but we were getting more," he said.

"We needed more dollars. That's really what killed it," Lara said. "The system costs more per rider than a lot of others, but we must be ready, willing and able to cover these costs."

An official report issued by the Transportation Agency after the demise of Dial-a-Ride concurred with Lara's assessments of the costs. "The price of adequate transit services is high," it said, and added that "the viewpoint that transit should be paid for solely by the so-called 'customer' lingers on."

Lara disagreed: "The public is supportive of the idea of public transporation. We should have gone to the voters long ago." He felt the public would have been more responsive when the energy crisis was in full swing and inflation rates were lower.

"The people in Santa Clara are looking for ways to get out of their cars. They are looking for an attractive, convenient method of public transportation," he said. "But they won't give money until they see an effective system. We didn't have much of a chance to prove that to them."

The system was not operated long enough to judge its effect in reducing the use of cars, Lara said. The consensus in the county was that its greatest effect seemed to be on the elderly, handicapped and low-income groups without access to cars.

"There were a lot of poor people and low-income people who used Dial-a-Ride," Jack Ybarra, chairman of the transportation commission, said. "Nobody really believed there were that many people who really supported Dial-a-Ride simply because they didn't go down to the board chambers to scream and holler."

The official report concluded that "politics, as a part of transit marketing, is typically regarded as a separate arena. It is not. Political accomodation is inextricably bound to technical solutions. This fact was inadequately recognized, and the problem of political passions was dismissed by technicians, professionals and politicians alike."

Overpayments Made to 15,000

DP Flaw Causes $10.5 Million Welfare Error

(Continued from Page 1)

tight control," Bynum explained. "The fact this could hit us in the eye like this will sharpen us really. It was an expensive lesson, but we've learned from it."

But the full lesson may not be learned for some time yet. Unwarranted payments to clients totaling $403,798,830.74 since SSI began is apparently only a partial estimate of how much the new program has cost in overpayments, duplicate payments and payments to ineligible clients. When all have been accounted for, the total could climb as high as $1 billion.

In addition to some programming problems, the DP bureau spokesman noted many of these payments occur because of the difficulties of keeping up-to-date records on each recipient. "Incomes, resources, property, living arrangements, assets are constantly changing in nearly every case," he said. "If a recipient wants to contest the SSA's decision to reduce his payments, that person is entitled to a legal decision on the matter before the problem can be resolved."

"We picked up on much of the overpayment in the program by conducting the required annual redetermination or recheck of the accuracy of the data fields we work with," he added.

Another spokesman for the SSA commented that the overpayment figure is really insigificant – amounting to only 3% of the total payments made under SSI since the system began. Thus far, about $82 billion has been funneled into the welfare program serving 4.2 million.

The spokesman added that $57 million had already been recovered by sending out smaller checks in later payments, but noted this means of recovering the funds is limited due to the rights of those covered under the program.

Bynum suggested that the overpayment figure be balanced off against SSI's underpayments, which amount to about $35 million and which headlined many local newspapers during the first few months of the program's operation.

The balancing method has been rejected by several SSI officials as "invalid." "When we discover someone has been underpaid, we have to make it up. We rarely get money back from an overpayment," one said.

Various congressional, outside, state and federal auditors, including the General Accounting Office, are investigating the SSA computer operations and have been for the last few months.

According to a report in the *Washington Star*, John T. Walsh, chairman of a team of auditors from various states that is examining the SSI records in particular, wrote to the head of the Department of Health, Education and Welfare which includes Social Security. In his letter, Walsh said, "Many of the accounting and systems deficiencies which existed in the first six months of the program, existed throughout the following fiscal year [1974-75] and still exist."

Also in the *Star* was the comment that, when Congress was considering SSI, its members were assured the SSA's computer operation, years of DP experience and reputation for being among the most efficiently run federal agencies would make the system work from the word go.

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Most Marked Growth at Small Sites

Study Finds DP Starting Salaries Rose 6.8% in '75

By Catherine Arnst
Of the CW Staff

NEW YORK – DP starting salaries for 1975 rose an average of 6.8% over last year, according to the findings of a recent survey by the Robert Half Personnel Agencies, Inc.

The largest increase for any job category came for DP managers at small installations, whose starting salaries rose from $14,000 to $16,000 to $15,000 to $20,000, an increase of 16.7%.

Salaries for computer operators at installations of any size, by contrast, did not change at all.

The study, conducted annually, was based on an analysis of position requests received by Robert Half offices throughout the country. The company cautioned there is some difference between starting salaries in cities in different parts of the country, but added that difference generally is not greater than the variance in salaries between a large city and its suburbs.

Job descriptions were broken down according to size of installation – large, medium and small – and the categories included programmers with up to one year of experience, programmer/analysts, lead programmers, system analysts, managing system analysts, operations managers, DP managers and computer operators.

Discrepaneies by Site

The salaries of programmers at large installations rose only 2%, according to the study. At medium-sized shops, salaries increased 4.3% and jumped 10% at small sites.

While the 10% increase at small installations brought those programmer's salary range up to between $10,000 and $12,000, the salary range at large installations was still higher – $12,000 to $13,500 – despite the smaller percentage increase, the survey found.

This rule held for all job categories at small installations – although salary ranges increased more by percentage points than those at medium to large installations, salary levels were lower in terms of dollars.

The average percentage growth for each position was 11.9% for programmer/analysts, 6% for lead programmer (a position listed only for large installations), 6.5% for system analysts, 7.3% for managing system analysts, 8.6% for operations managers and 10.3% for DP managers.

A demand for highly competent employees greater than the available supply was cited as the reason for the overall increase in starting salaries by Bill Kohler, account manager for Robert Half. He called any influence the increased cost of living rate may have had minimal.

"Our company is still getting more orders than applicants, and companies have expanded their fringe benefits and salaries in order to attract competent employees," he said.

Kohler attributed the lack of change in starting salaries for computer operators to the "greater influx of entry-level people" at this position.

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White House Still Dragging Feet On Naming of EFTS Commission

(Continued from Page 1)

the head of the commission, so. . .

No one in the presidential Personnel Office was available for comment on the situation. It is unclear at this time if invitations to join the commission have been sent to selected candidates and rejected by them (which seemed to be the situation in April) or if invitations have not gone out at all.

Earlier in the month, the personnel office responded to an appeal to President Ford from Jerome Dreyer, executive vice-president of the Association of Data Processing Service Organizations (Adapso), in which Dreyer urged Ford to complete and activate the commission.

But the White House response was certainly nothing to cheer about.

In his letter – dated June 2 – Dreyer acknowledged there were "many considerations involved in the appointment of persons to important commissions," but told Ford "it is of substantial importance to our nation, and to the world, that the work of [this commission] be begun and completed at the earliest possible time."

He went on to point out Congress' mandate that the commission's work be done in two years and noted "the private sector, and many other aspects of the public sector as well, are not holding up their activities during this period.

Seventy-two days after Dreyer wrote his letter, on August 13, the presidential Personnel Office responded:

"Dear Mr. Dreyer:

"The President has asked me to thank you for your correspondence concerning the appointment of members to the National Commission on Electronic Funds Transfer.

"Your interest in making your views known is most appreciated. We are pleased that you took the time to share your thoughts and I want to assure you that your comments have been noted.

Sincerely,

Douglas P. Bennett
Director"

Info 75 Designed To Court End User

(Continued from Page 1)

dustrial, commercial and service areas: manufacturing, retailing, banking, insurance, hospitals and health care, transportation and public utilities.

Info 75 coverage continues on Page 8.

And there are five functional conferences-within-a-conference which cover areas common to most organizations: marketing and sales, financial, office systems, records management and telephone communications.

Sessions will run from 9 a.m. to 5 p.m. each day and will be held at the Americana Hotel.

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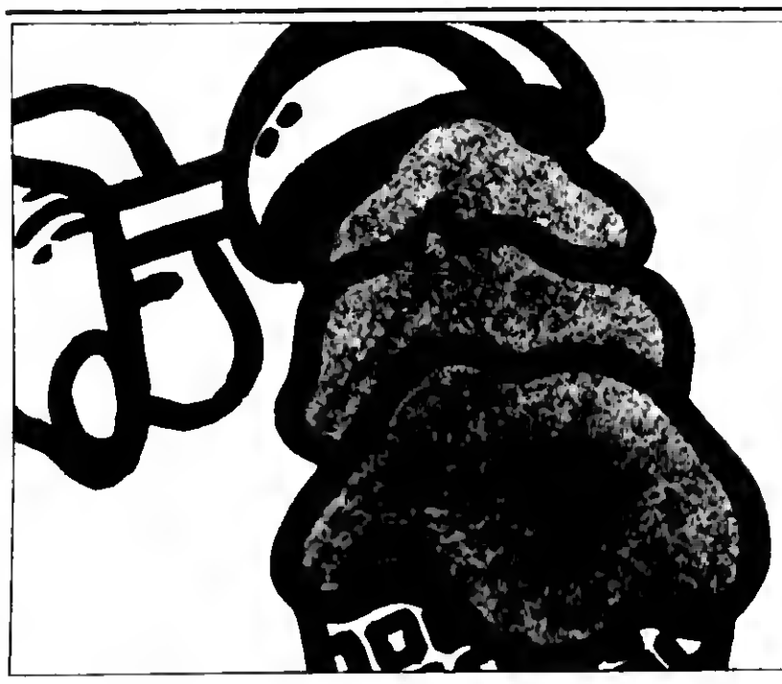
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Catamore Files Detailed Counterpoint to IBM Motion

By Molly Upton
Of the CW Staff

PROVIDENCE, R.I. – Catamore Enterprises, Inc.'s attorneys have filed a detailed, blow-by-blow counterpoint to the IBM motion asking the judgment in favor of Catamore be set aside or a new trial be held [CW, Aug. 6].

Claiming IBM's memorandum contained "inconsistencies, false presumptions, inaccuracies, gratuitous editorial comments and inflammatory remarks," the Catamore memorandum supported Judge Raymond J. Pettine's charge to the jury and asked the court to deny IBM's motion.

The Catamore filing said IBM's memorandum included "faulty premises of fact and law, is unsupported by the record of this case and [is] a misapplication of the facts of this case."

On some points, the Catamore filing claimed, cases cited by IBM in its brief were not relevant to the points IBM was making.

In a long list of counterarguments, Catamore's memorandum maintained that the jury's verdict awarding Catamore $11.4 million in its counterclaim was consistent with its verdict for IBM in the amount of $68,453 for unpaid rental.

The dual awards were evidence only that the jury did not find fraud in the inducement of the Machine Services Agreement, Catamore said.

Evidence, both oral and written, supported the jury's verdict and, if anything, was on the conservative side, Catamore contended.

Catamore disputed the IBM claim that the jury's award was derived from duplicative damages and claimed all parties, including Catamore, took great care to delineate those damages that might overlap or be duplicative.

An IBM witness, George Jamieson from Price Waterhouse & Co., stated the total amount of damages, as adjusted by him, was $19 million, Catamore pointed out.

Duty of Care

Furthermore, Catamore said, the court was correct in instructing the jury that the law imposes a duty of care upon IBM so that it should have warned Catamore of the dangers of converting to a computerized system.

Catamore pointed out the "assignment of a trainee and the failure to warn alone constitute two separate negligent acts or omissions, fully supported by the evidence."

In addition, "IBM's assertion that as a matter of law the software agreements were 'too vague to be enforceable' is not only absurd on the record; it is also unconscionable," Catamore said.

Catamore took IBM to task for implying "that contracts which do not contain terms limiting liability must fail. IBM does business by attempting to limit its obligations under its preprinted form contract for hardware.

"While the vast majority of IBM's software agreements are oral, IBM attempts to avoid these oral contracts by hiding behind the parole evidence rule," Catamore said.

Parole evidence forbids the introduction into evidence of oral agreements when they are ruled to cover the same subject as the written agreements and are intended to be included in the written agreements.

The rule was not applied to the oral agreements for software and services.

"To imply that contracts must have built-in disclaimer clauses in order to be definite enough to be enforceable cuts to the very heart of that time-honored principle" by which the "law presumes that men engage in business in good faith," Catamore said.

Attorneys Object To Name-Calling

By Molly Upton
Of the CW Staff

PROVIDENCE, R.I. – Calling comments made by IBM counsel in its motion for a new trial [CW, Aug. 6] "scandalous," attorneys for Catamore Enterprises, Inc. have asked the U.S. District Court here to discipline the IBM lawyers who signed the document.

In addition to taking "appropriate disciplinary action," the court should impose sanctions on IBM counsel to ensure good conduct in the future, Catamore attorneys said in a motion filed with the court.

Among the signers of the IBM motion were IBM chief counsel Nicholas deB. Katzenbach and Thomas Barr, lead attorney from Cravath, Swaine & Moore, which is representing IBM in the U.S. vs. IBM antitrust case.

Public Relations Purposes

Catamore charged IBM attorneys used the memorandum for public relation purposes. Such action was "an additional instance in a pattern of arrogance and disrespect to this Honorable Court and to its officers," the Catamore document said.

Catamore took issue with IBM's claim that Thomas K. Christo, Catamore's lead attorney, made "unfounded and scurrilous statements" during his final argument.

Catamore also objected to IBM calling Catamore President Robert Catanzaro's projections "pipe dreams."

The use of the terms "unfounded and scurrilous" was "frivolous and scandalous, and an attorney who resorts to such tactics should be disciplined."

Calling Catanzaro's projections "pipe dreams" was "completely unnecessary and demeaning to that man's business acumen," wrote Christo.

Catamore's memorandum said "this kind of allegation that counsel for the defendant in effect misled the court or knowingly lied to the court is reprehensible and should not be tolerated.

"What is obvious from reading" the press reports attached to Christo's affidavit accompanying the Catamore memo "is that the plaintiff's 'memorandum' was in fact nothing more than a device whereby the plaintiff could allay fears of certain institutional investors and the investing public in general about the implications of the jury's verdict in this case on IBM . . .," the Catamore memorandum stated.



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Conn. Saves $6.1 Million by Canceling Order for CPU

By Edith Holmes
Of the CW Staff

HARTFORD, Conn. – Sloppy business practices, rather than conflicts of interest, seem to have been behind Connecticut's lease of an IBM 370/168 it didn't need.

When a study revealed the state was wasting about 70% of the capacity of the 168 it had installed, officials realized the second 168, already on order from the manufacturer, was totally unjustified.

The state will save approximately $6.1 million by not leasing the second mainframe from Systems Equipment Lessors, Inc. (SEL) in Greenwich, Conn., according to the consultants who conducted the study. The study by Systems Implementation, Inc. of Columbus, Ohio itself cost $4,647, state officials said.

In an announcement of the actions the state planned to take, Gov. Ella T. Grasso stated no attempt had been made to acquire comparable computing power from a manufacturer other than IBM.

Connecticut leased the two mainframes from the third-party lessor in July 1974 and had since installed one of the machines. A change in administrations early this year prompted questions about the eight-year lease. Charges of conflicts of interest and lack of need led to the study, officials said.

Interest Transferred

Acting on the recommendations made by the consultants, the state attorney general's office entered into negotiations with SEL and recently signed an agreement transferring Connecticut's interest in the second 168 to the Manufacturers Hanover Trust Co. of New York.

Gov. Grasso has said that, in addition to canceling the contract for the second machine, Connecticut will also incorporate other suggestions made by the consultants to increase the effectiveness and efficiency of the state's DP operations (see accompanying story).

In conducting their study, the consultants determined there are a number of installations in state agencies "that result in the state paying for a considerable amount of unused computer capability."

But, users in the state's central data center and at the University of Connecticut (UConn) were concerned about inadequate response time. It seemed the hardware – two 370/155s – was being fully utilized and demands on the center appeared likely to continue to grow.

Because their central data center was to acquire the two larger mainframes, state officials then moved the two 155s to UConn.

But, the consultants reported, "these machines are also under long-term lease and, as such, represent a continuing obligation of the state. The movement of these machines to the university will clearly provide excessive computer capacity there," they added.

While they found only 30% of the capacity of the one 168 installed is being used, the consultants did say future new applications and additional users justify its acquisition.

IBM Adds Products To 'Not in New' List

WHITE PLAINS, N.Y. – IBM has added several pieces of equipment to a classification known as "not in new production" since January of this year.

This is actually equipment no longer produced by IBM factories. IBM customers who place orders with their local representatives often are shipped equipment classified in this manner.

What these users receive are rebuilt units under warranty by IBM as if they were new.

They are:

- The 3158 and 3168 processing units for the 370/158 and 370/168; 3330 models 1 and 2 disk; 3333 Model 1 disk; 3830 storage control Model 2; 0129 card data recorder; 2305 Model 1 fixed-head storage; 2835 storage control Model 1; 3713 printer; 3215 console printer/keyboard; 3504 and 3505 card readers; 3525 card punch; 1035 badge reader; and the 5203 printer.
- Also the 360/195 and 370/195 systems, specifically with the following units: 3060 system console; 3080 power unit; 3085 power distribution unit; 3086 coolant distribution unit; and 3195 processing unit.

Senate Kills Bill to Stop Parent Locator Service

WASHINGTON, D.C. – The Senate has defeated a bill to abolish the Parent Locator Service, a controversial plan that permits the Federal Government to use computerized records to locate parents whose absence has put their children on welfare.

The House had passed a measure to block start-up of the program [CW, Aug. 20]. But as a result of the Senate action, the service has gone into effect.

Established within the Department of Health, Education and Welfare's Social and Rehabilitation Service, the Parent Locator Service has been given authority to use virtually any means necessary to locate delinquent parents.

These methods include access to the files of any federal agency. They may take the form of running magnetic tape records of missing parents' names and Social Security numbers against master tapes in both the Internal Revenue Service and the Social Security Administration to find their last known address and employer.

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Recommends Future Conn. Policies

Study Pinpoints 'Questionable' Purchase Procedures

By a CW Staff Writer

HARTFORD, Conn. – Connecticut's "questionable procedures" for acquiring additional computing power included a myopic preference for IBM and a failure to protect against potential conflicts of interest, consultants conducting a study for the state indicated.

A leasing contract which put the state at a severe disadvantage, a lack of state DP personnel and a deficit which could eventually grow to undermine state DP operations were also identified by their findings.

Lessons learned by Connecticut and recommendations posed by their Ohio-based consultants, Systems Implementation, Inc., can prove instructive for other state and local DP operations as well.

The consultants urged the state and any of its agencies acquiring DP equipment to "open their doors" to all vendors and to apply all bidding procedures to leasing companies and potential suppliers of software, system design and the like as well.

They noted vendors should receive notice of the state's intent to procure hardware or software, be given the opportunity to offer proposals, be assured their proposals will receive unbiased consideration and know what the state's needs are and on what bases the contract will be awarded.

Disclose Interests

To protect against conflicts of interest, the consultants recommended officials involved in procurement decisions be asked to disclose any interests – ownerships, partnerships, stock holdings, consulting relationships – which they or their immediate families have to any suppliers involved in the bidding.

The consultants questioned the kind of leases for the IBM 370/168s which the state chose to sign with Systems Equipment Lessors, Inc. (SEL).

They noted the leases contained such "significant characteristics" as balloon provisions, calling for a rental of $42,862.50 for the first 12 months and a rental of $75,622 for the remaining 84 months of the contract for the first 168; no responsibility on the part of the leasing company for the quality of performance of the equipment; state responsibility for any insurance and taxes; and a cost to SEL of $4.3 million for one machine while the state would pay over $6.8 million on the contract. Also, when the contract expired, SEL was to receive the computer delivered at state expense.

Hire Competent People

They also suggested the state hire competent people to handle tasks often farmed out to consulting firms.

If the state is not able to compete with private enterprise for the best DP personnel available due to low pay scales, "we recommend the state scales be adjusted," the consultants added.

They stressed the need for specific milestones and progress payments in those instances where consultants are used, noting an instance in which Connecticut contracted for the development of a payroll/personnel system, has paid over $500,000, but has yet received little or no usable output from this expenditure.

Improve DP Management

The consultants recommended that the state improve the level of its DP management and technical expertise by including a DP manager, a systems programmer and a systems analyst on its staff.

An advisory committee organizing the talents available within local private enterprise and a user committee composed of representatives of those agencies relying on the data center could also provide valuable forums for discussing proposed changes or possible problems, they added.

'Officials involved in procurement decisions [should] be asked to disclose any interests . . . they or their immediate families have to any suppliers involved in the bidding.'

The consultants noted indications that the revolving fund for DP will run a deficit of $200,000 to $300,000 during the current fiscal year. "If neither pricing policy nor projected expenditures for fiscal '76 are changed, the situation will become even worse, with revenues falling short of spending by about $1.3 million," they said.

In addition to recommending the state not lease the second 168, the consultants suggested the center consider selling more processing to state and to outside users, making its prices for such contracting competitive and acquiring some additional state appropriations.

Any profits gained through outside contracting could be used to repay the state subsidy, for programs to maintain the center such as research and marketing and to reduce prices to the state agencies, they noted.

Consolidate Operations

Finally, the consultants urged state officials to make consolidation of state DP operations their basic objective. They added, however, that special conditions at individual agencies should be taken into account in moving toward the goal of one or two large state data centers.

"To the extent that manual data processing is being used in cases where automatic data processing would be more efficient, the state is losing money by not spending more on DP," the consultants said in their study.

They added, though, that procedures should be recommended to avoid such "common pitfalls" as "using on-line systems where batch processing would do about as well, using teleprocessing where the mails would suffice, buying systems that convert hard copy into computer language and retrieve it as hard copy and where marginal increases in response time are being obtained at horrendous marginal costs."

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Sessions to Stress Management, Technology

NEW YORK – Stressing the "critical interface" between DP and the rest of any enterprise, nine management and 17 technology sessions will focus on minimizing the effectiveness of people and equipment at Info 75 here next week.

Three case histories delving into the opportunities and pitfalls of computerized information systems intended to reduce an organization's overall costs will open the conference's management sessions on Monday morning, Sept. 8.

Because an ineffective information system is often the direct result of a lack of planning, one session will be devoted to the five-year-plan approach to building such systems and another to management by objectives as applied to systems development. These will be held on Monday afternoon and Wednesday morning, Sept. 10, respectively.

The conference will place considerable emphasis on the "how tos" of creating a competent information systems staff, including four sessions in its program on this topic.

The first of these sessions will deal with what the universities are doing to train students to develop and manage information systems in business – and what they could be doing. Business executives and university and college faculty members will talk about the often inadequate preparation of graduates for business and industrial information systems careers in a panel discussion.

Following this Wednesday morning session will be two afternoon meetings focusing on how to hire and retain competent information systems personnel and the responsibilities and impact of systems programmers on the DP operation.

Finally, alternatives for maximizing the effectiveness of critical personnel assigned to various DP project areas will be treated in a session held Thursday morning.

Selling top management is a key theme in two sessions: one on achieving approval of information systems proposals and the other on building security into a modern DP center. Held on Tuesday and Thursday mornings, Sept. 9 and 11 respectively, these sessions conclude Info's offerings in the management area.

In keeping with the cost/benefit tone set by the management sessions, conference meetings under the heading "technology" will often focus on the word "trade-off."

A two-session series on system upgrading and replacement will deal with conversion trade-offs and portability considerations, for example.

Similarly, a Thursday afternoon session will be devoted to auditing the DP installation for its cost-effectiveness; and Tuesday morning meetings to the pros and cons of centralization and decentralization and using improved technologies for applications development.

Data Base Basics

Several of the technology-oriented sessions at Info will deal with data base concepts, systems and management. Selecting a data base management system with all the necessary evaluations and trade-offs will form the subject matter of a Wednesday afternoon session.

In addition, the implications of data base concepts for general management will be discussed by a panel from the point of view of general management on Thursday morning; the security and integrity considerations for data bases will be treated on Tuesday afternoon; and the need for data base administrators to act as interfaces between DP functions and the enterprises they serve will form the basis for a Wednesday morning session.

Communications

Three sessions will deal with data communications: one Monday morning on the design and operation of data communications and on-line systems; a second that afternoon on the reliability and performance characteristics of data communications and on-line systems; and a third Tuesday morning on the recent developments of data communications and their impact on the DP function.

Also part of Info's technology program are meetings on keyed data Wednesday morning, on the new mass storage systems Thursday morning and on executives' use of interactive graphics terminals that afternoon.

Finally, conference participants will be treated to a Monday morning discussion of the user implications of fourth-generation system architecture.

Industry, Service, Commercial Areas Focus of Meeting

NEW YORK – Industry sessions here at Info 75 will cover seven major industrial, commercial and service areas: manufacturing, retailing, banking, insurance, hospitals and health care, transportation and public utilities.

• Manufacturing

A plenary session Monday morning, "How Top Management Satisfies Its Information Needs to Plan and Manage a Complex Company," will introduce this area of interest. It will be followed by two concurrent series of sessions.

Monday afternoon's "A" session will explore the development of the master schedule for accurate predictions of sales and their integration with the corporate plan to forecast production requirements. "Improving Productivity Without Fixed Capital Investment Through Planning and Scheduling," a case study of the computerized logistics system of the Black & Decker Mfg. Co., will be given Tuesday.

On Wednesday, "Planning for the Manufacturing Capacity Needed to Meet Demand," with papers focusing on both short-range and long-range planning, will take place in the morning, followed by discussions in the afternoon on data capture and shop floor control to assure production matches the master schedule.

The final "A" session Thursday morning will be on information systems used to monitor the progress of manufactured goods from the factory to the end user.

Tuesday morning, the "B" series will begin with talks on information technology to control the storage and routing of semi-finished and finished goods in high productivity manufacturing facilities.

Wednesday sessions will include "Information Systems to Improve Maintenance and Control Its Impact on the Production Schedule" in the morning and, in the afternoon, talks on computer use in "Engineering the Job."

The series will finish with "Quality Control for Economic Survival" – a session on automated testing systems for in-process inspection.

• Retailing

Retailing sessions cover all aspects of the total information system to support executive planning and decision making in the retailing organization. "Forward Planning – Setting Goals – Establishing Strategies and Developing a Supportive Information System," will start the series Monday afternoon.

On Tuesday, discussions on information systems in merchandise management will be held in two parts. In the morning, papers will be presented on a classification structure that will help detect emerging and down-trending businesses and exception reporting of fast-selling and slow-selling styles. Managing hardgoods and staples and big ticket merchandise will be the focus of the afternoon program.

"The Information System in the Retail Operation" and "New Technology in Sales Audit and Credit Systems" will be held consecutively Wednesday morning, and, in the afternoon, distribution and warehouse systems will be covered.

The series will conclude with "Putting It All Together – The Total Information System" Thursday morning.

• Banking

Seven sessions are included in this section, beginning with talks on the approaches senior bank executives have taken in satisfying the information needs of their organizations.

Tuesday afternoon will feature two concurrent sessions, "Expanded Financial Services for Growth and Greater Profitability" and "The Bay State Computer Center – A Case Study."

Both "Cost Containment and Bank Operations Through Information Technology and Cost Reduction Planning" and "Information Systems in International Banking: A Case Study of Chase Manhattan Bank" are scheduled for Wednesday.

Thursday will be devoted to electronic and financial transfers with meetings on electronic funds transfer systems realities and strategies.

• Insurance

The insurance sessions will start Tuesday morning with "Profitability Measurement in a Multiple Line Insurance Company – the Problem and Some Systems Designed to Present Profitability Measurements." In the afternoon, problems of and solutions to cost control in a life insurance company will cover manpower and budgeting control and unit costs.

"Planning for the Changing Federal Pension and Insurance Environment" and "Privacy of the Individual's Data in a Life Insurance Company – Short- and Long-Range Systems and Cost/Performance Considerations" will both be held Wednesday morning; discussions on the approaches taken by senior insurance executives to satisfy the information needs of their organizations is scheduled for the afternoon. The Thursday morning session will cover "Impact of On-Line Systems on Insurance Companies."

• Hospitals and Health Care

Tuesday will be devoted to "Information Systems: Rx for Health Care," an overview of hospitals and health care organizations dealing with health information requirements while viewing such care as a business. On Wednesday, sessions will focus on maximizing information and cost-effectiveness in hospital and health agency operations in the morning and computer-based information systems in the hospital during the afternoon.

"Knowledge Management in the Hospital Library" and large and small information systems in health care will both take place Thursday morning. Afternoon sessions will center on "Auditing the Elusive Measure of Quality in Health Care."

• Transportation

The first in this series will be "Transportation and Electronic Data Systems" Monday morning. Afternoon talks will cover energy problems in transportation and information systems and means of alleviating them.

A series of three sessions on "Information Systems in Fleet Management" begins Tuesday morning with applications paying special attention to minis.

• Public Utilities

These sessions will start off with a case study of Consolidated Edison Co. of New York, Inc. – "On-Line Customer Service for Nine Million People – The Need, the Payoffs and the Costs."

Three sessions are scheduled to treat "Resource Management for the Public Utilities." Tuesday morning will cover optimizing facilities and materials in daily operations, the afternoon will continue with long-range planning under uncertain conditions, and on Wednesday the series of meetings in this area will finish with interactive power system analysis.

A second Wednesday morning session has been planned to discuss "The Integrated MIS in a Public Utility – Features and Operating Experience of a Working System."

Conference to Spotlight Minis

NEW YORK – Recognizing the "new wave" of minicomputers and their applications in both small and large businesses, the sponsors of Info 75 have dedicated several sessions to these devices.

Kicking off this portion of the conference is a Monday afternoon meeting designed to introduce minis to those unfamiliar with them. An evaluation of requirements related to system and machine selection and a talk on the organizational and procedural impact of minicomputer systems will follow a presentation on what minis are and how they're being used in business today.

Tuesday will be devoted to minicomputers in manufacturing and in the office. The morning session will look at these devices as they are used in the apparel industry, the automotive industry and for factory monitoring and reporting systems. A panel discussion in the afternoon will discuss turnkey mini systems designed for office use.

Minis in distribution and minicomputer alternatives in business applications are the scheduled topics for Wednesday morning and afternoon respectively. The rationale and economics of distributed processing in national distribution organizations, the possibilities for multivendor dedicated systems in geographically dispersed distribution facilities and the relationship between distributed processing and telecommunications will be discussed.

Among the alternative uses of minis in business applications to be treated are the on-line, the intelligent terminal remote batch and the small business processor approaches.

Finally, on Thursday morning, there will be a session on the use of minis in banking, including Citibank's conversion from a large system to a minicomputer, a talk on financial display systems and a presentation on a minicomputer-based portfolio system.

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COMPUTER CARAVAN 76

BOSTON, NEW YORK, WASHINGTON, D.C., ATLANTA, DETROIT, CHICAGO, DALLAS, LOS ANGELES, SAN FRANCISCO

Editorial

Hiding From Reality

A recent survey confirmed a *Computerworld* finding that the majority of women in DP do not feel they are discriminated against [CW, July 23].

The survey, reported in the August issue of *Datamation*, found that overall, two-thirds of the women questioned feel they have equal status with their colleagues.

The survey of 425 women in the field showed that almost 70% of the women feel they have equal status in the area of pay, and that 66% feel they have equal status when it comes to promotions.

Furthermore, the survey, conducted by Dr. Winifred Asprey and Anne W. Laffan, found that 70% of the women felt they had a chance to hold highly responsible positions at senior technical levels of a company and that 56% felt they had an opportunity to advance to highly responsible positions in upper management.

If only it were true.

Another study, one of the few statistical surveys on employment in the field, painted a picture of discrimination that is obvious, pervasive and widespread.

Not only are women a small minority (20%) of the overall work force in the computer-user areas, compared with industry as a whole where women account for 39% of the work force, but they are systematically paid less than their male counterparts even when performing the same tasks, according to the analysis by Richard E. Weber and Bruce Gilchrist in the July *Communications of the ACM* [CW, Aug. 6].

For some reason, DP has been able to sell itself as a field where there is true equality of opportunity. And it has done such a good job that even the majority of the victims of discrimination are either unaware of it or are misled by the claims.

This probably means that the discrimination in this field is more subtle than in most and that the feeling of action, change and advancement that surrounds computers has blinded people to the actual situation.

Unfortunately this type of discrimination is hard to fight. No one feels there is a problem so it becomes difficult to find solutions.

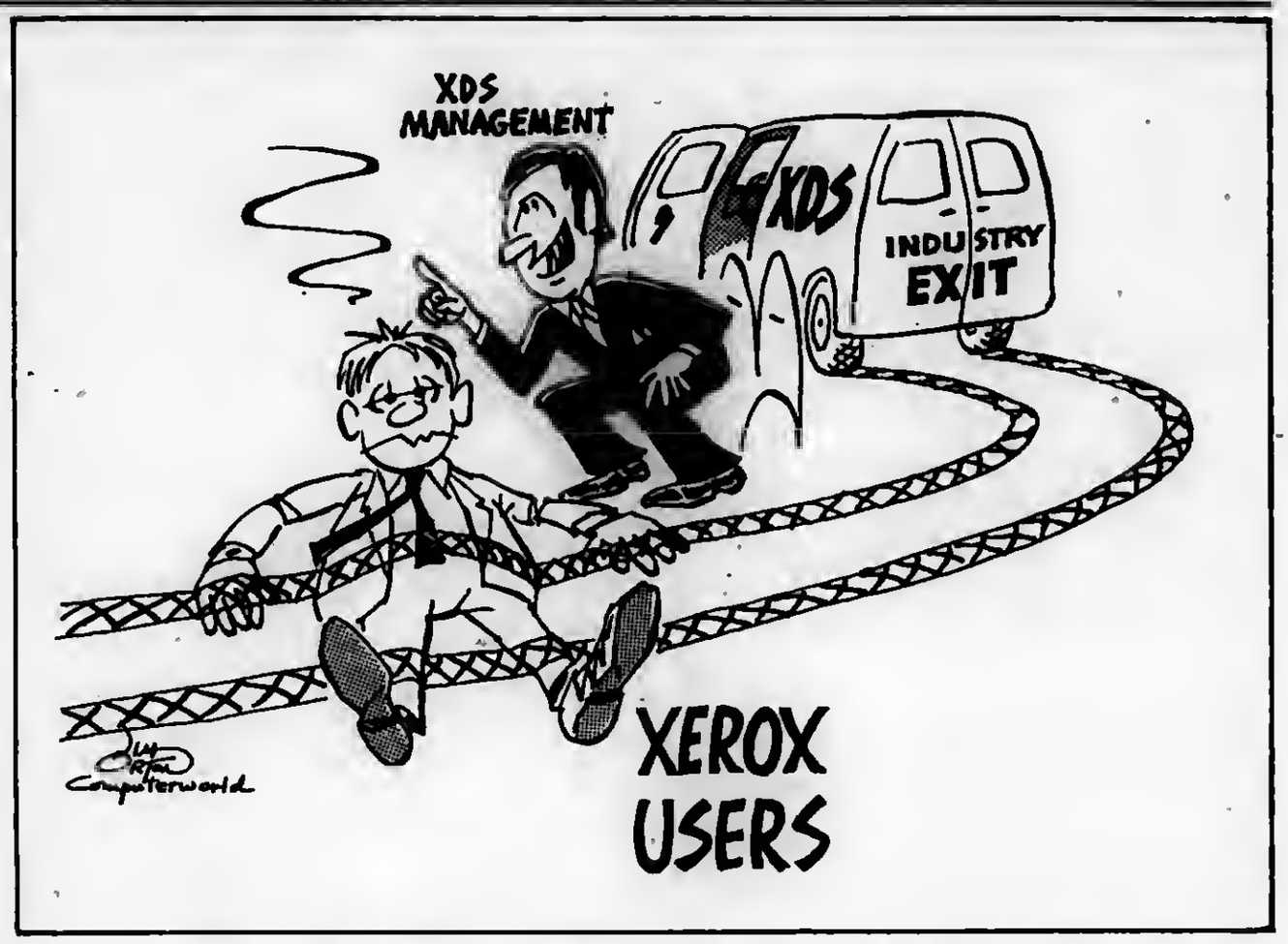
There is a problem, however. It is clear, blatant and will not go away.

All users and manufacturers should review their pay schedules carefully. There can be no justification for unequal pay between men and women who perform the same function. If there are such discrepancies in your shop — and there probably are — they should be changed — fast.

Furthermore, more organizations should begin to pay real attention, rather than lip service, to their claims of equal opportunity for advancement, because the statistics show those claims have been more hot air than substance.

Laffan is correct in her contention that "the computing field holds great potential for women."

But much needs to be done to turn that potential into reality.



'Just Stay Calm and Don't Move Until We Decide What's Next . . .'

Letters to the Editor

ACM Not Official Participant, Can't Withdraw From IJCAI

It seems to me rather deplorable journalism to write an editorial castigating the Association for Computing Machinery (ACM) for its actions (or lack thereof) on a matter in which it essentially has no involvement. I refer to the Aug. 20 editorial in which it was stated ". . . ACM, as one of the participants in the [International Joint Conference on Artificial Intelligence (IJCAI)], has apparently buckled under to the Soviet demands, violating its own tenets which bar participation in meetings that do not honor the International Council of Scientific Unions standards of scientific interchange."

The actual fact is that ACM has no official involvement or participation (with one minor exception noted below) in the IJCAI. As far as I know, the organizers of past and present IJCAIs constitute an informal group put together to run each meeting. Nobody has requested any official participation from ACM, and so ACM as an organization is not a participant in this conference.

The question of whether we could retroactively impose a policy passed by the ACM Council in May 1975 is thus moot. While it is true that people who are active in ACM are also active in the preparation of IJCAI, this does not create official ACM participation.

Surely you would not limit the right of a person to participate in two activities at the same time and you should not assign one organization the responsibility of activities in the other. That is guilt by association applied in the worst way.

Each person must act as his or her own conscience dictates. I presume individuals who go to this meeting in the light of the current circumstances feel it is appropriate for them to do so.

Since we can't withdraw from something in which we are not a participant, your suggestions to do so are not very constructive, and your statement that ACM is buckling under is rather insulting. In any case, trying to do anything approximately two weeks before the meeting (which is scheduled for Sept. 3-8) is impractical in an organization whose highest governing body, the Council, involves 25 individuals scattered all over the country.

Even if ACM were involved, it would not be practical to take action in a democratic fashion under those circumstances. It is interesting to note that of all the people who have exhibited concern about this meeting for a full year, none of them ever sent me a letter asking ACM to take formal action to disavow the appropriateness of the 1975 IJCAI as a technical meeting.

The exception referred to above involves the financial support to an individual who will give a talk at the IJCAI meeting identified, I believe, as the "ACM Computers and Thought" lecture. This has been done at the two previous IJCAI meetings and is viewed as a service to the attendees and an honor to the speaker.

Following normal procedure, the relevant ACM committee chairman notified the IJCAI chairman about this early in 1974. By the time it was realized early in 1975 ACM had this minor involvement, the Executive Committee decided that it was inappropriate to take formal action to consider undoing a normal event.

The ACM Council was notified of this and nobody proposed anything different. It would be grossly unfair to the individual involved to withdraw his financial support at this time, which is the only conceivable action we could take. That would penalize one innocent person for the actions of a foreign government.

However much any individual may deplore (and I personally do) the political activites surrounding the current IJCAI in the USSR, ACM is not an official participant in IJCAI and therefore cannot withdraw from something it is not in.

Jean E. Sammet
President
Association for Computing Machinery
New York, N.Y.

IBM 'Watergate' Now Unfolding

The world must be shocked and surprised at the recent announcement that IBM has been contributing to Canadian political parties for several years [CW, Aug. 13].

In the May stockholders' meeting, Frank T. Cary, chairman of the board of IBM, denied IBM had been involved in any such shenanigans. In August he sent a letter to all the stockholders and to the press indicating IBM had been involved in such practices.

Cary has assistants who watch and analyze every word he says, specifically when they are published in the annual meeting reports, to assess whether they are accurate and correct.

Why did it take Cary and all his administrative assistants, lawyers, advisors, etc. so long to finally come out with the fact IBM did support political activity in Canada?

Cary was not unprepared. No corporation with the reputation of IBM is caught unaware.

Why did it take so long for Cary's Watergate to be exposed? How many other secrets does Cary have that may come out due to public pressure in the future?

It might be a great idea to have all of the conversations of the IBM board of directors' meetings recorded on tape. Silence would predominate, since IBM produces the equipment.

Timothy Allen
Summit, N.J.

(Other letters on Page 12.)

Getting Oriented

To find out the future of Eastern Europe, look toward Western Europe. To find out the future of Western Europe, look toward the eastern United States. To find out the future of snow-tire U.S., look toward California.

And to find out the future of California, smog, computers, curious fads and religions, and wall-to-wall people, go to Tokyo! Which a fair parcel of Computerworlders is doing now. The occasion is the second USA-Japan Computer Conference, held at the Tokyo Prince Hotel the week of August 25. The sponsoring outfits are the American Federation of Information Processing Societies and the Information Processing Society of Japan; a sizable bunch of Americans and a horde of Japanese have turned out as expected.

I'm speaking at a private seminar being staged by Dempa Publishing, which puts out our sister paper, *Shukan Computer*. My boss Pat McGovern, Owner of Us All, is also on the program. For both of us, it beats hitchhiking!

Then there are tours of Japan and to Hong Kong, followed by the technical program, assorted social events of course, and technical tours of very considerable interest. There are also preconference tutorials on data security and microcomputers. I look forward particularly to comparing the two opening speakers, one by my former head-to-header, Lew Branscomb of IBM, and the other by Bunichi Oguchi of Nippon Telegraph and Telephone, the Ma Bell of Japan. Both men are deeply research-minded, both belong to intensely paternalistic and monopolistic organizations. But East is East and West is West. Will the twain ever meet? If so, this should be the time!

There is lots of good gossip about Amdahl and Fujitsu, about the formal surrender at Xerox, about whether Mitsubishi can contribute much to the Fujitsu-Hitachi combinc. There are new perspectives on character recognition, lots and lots of hardware papers, and the usual dumb goop about artificial intelligence. I've noted some Japanese contributions to library automation and to computer-managed instruction that are new at least to me.

All in all, it seems to be a great show. It doesn't match in size or scope the enormous international triennial in Stockholm last summer, and Irish Coffee is even more expensive – as is everything else! But as an opportunity to do a binational exchange, to show each side how advanced, how vigorous the other one is, it is an eye-opener.

And for good eaters there is one of the world's most exciting cuisines, and perhaps the most beautifully presented. The sushi, the tempura, the teppanyaki – and for the more adventurous, the sashimi and the shabu-shabu. Pat has already beaten me to the occasionally fatal fugu (blowfish), and its not the best or safest season anyhow.

Wonderful, also, for those of us who have already made Japanese friends, here or in Stockholm or Paris, or in Japan, is the opportunity to renew and extend those relationships. Technology is good, food is better, and friendship is great (should have written "best" but I got to thinking about the Kitcho restaurant in Kyoto)!



Herb Grosch

System Design Unsatisfactory

Gas Firm's Data Gathering Leaves Many Users Cold

The Taylor Report
By
Alan Taylor, CDP



This week's example of poor computing practice concerns the failure of Boston Gas's revenue program on its IBM 370/135 to use the information it has available. As a result of this failure, new users get an unnecessarily hard-to-read bill, and errors can continue in the system for months without being caught, although all the necessary data to catch them is present.

It is a fact of life for Boston Gas and other utilities that inside meters cannot be read every two months regularly. Techniques are used to provide estimated bills. In the case of Boston Gas, the estimating technique is to break usage down into two parts – a basic usage and a "degree day" usage, that is, the additional amount of gas used by a customer for every day the weather is one degree colder than a preset value.

To get these two parameters, Boston Gas accumulates in the customer's records the total amount of gas used and the number of degree days the service has covered. Nothing is done with these figures, however, until two consecutive readings are made in the June to September period each year. When two such readings are made, it is assumed they represent the basic usage.

With this established, the degree day usage is calculated. Thus, if David Ames had used 37 units of 100-cubic feet between July 11 and Sept. 10 last year, Boston Gas would have been able to determine that his degree day usage since his service was turned on March 1 gave him a parameter of 0.003 per degree day.

Unfortunately, David Ames and the tens of thousands of other Boston Gas users were never told of the importance of the July and September readings.

Boston Gas could have told him in May, when they sent his first bill. There was space for three 70-character lines of message right on the bill, but Boston Gas did not alert Ames to the fact that estimated billing would be based upon real meter readings for this particular period.

Different History Used

With the failure of this data-gathering system, Boston Gas fell back on another technique with which to estimate David Ames' bills. It used the parameters for the previous occupant of his apartment. Both users, in fact, appear to have the same basic usage, 18.5 units at 100-cubic ft/mo. This more than doubled the degree day parameter, making it .007, instead of what is now known to be the accurate .003.

Again, however, Boston Gas did not tell Ames this – or anything at all about how it was estimating his usage.

They could have done so, of course. The message could have been placed on the face of the July 1974 bill telling him it had decided to use someone else's history on which to estimate his bills. But the gas company didn't do it.

Not only did Boston Gas not tell Ames about this fall-back system of estimating – it did not check whether the history it did have on Ames supported it. It could have done so, because it had actual meter readings on March 1 and May 10, 1974, a period of 2.3 months with over 1,000 degree days. This would have given a usage of round 50 units of 100 cubic feet, if the prior occupant's parameters fitted Ames. But the actual usage was only 39 units of 100-cubic feet, as the billing shows. So it was clear before Boston Gas ever started estimating Ames' usage that the secret parameters they secretly allocated to him were incorrect.

From a processing point of view, the essential error is that Boston Gas concealed its techniques from the gas users. The technique of estimating is not particularly bad, although it needs improvement and, in particular, needs to check for contraindications.

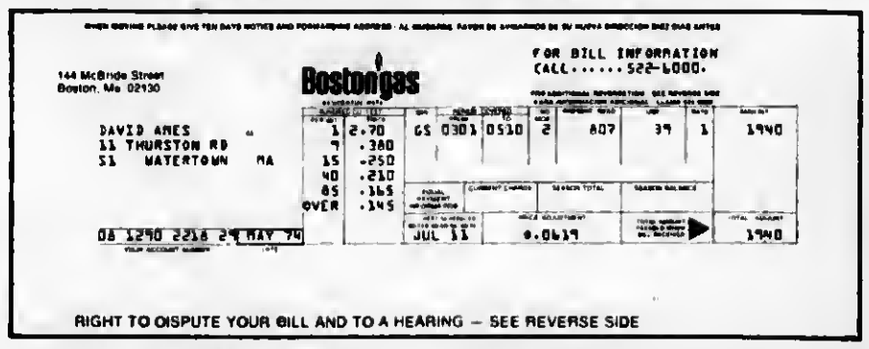
The data-gathering – that is, getting the key meter readings – however, needs to be greatly improved, particularly for the tens of thousands of new users.

The current technique of Boston Gas is simply to send out enclosed folders, asking that users entrust their keys to Boston Gas or tell Boston Gas where its meter reader will find the key hidden (under the mat, perhaps?). Not surprisingly, this leaves many people cold.

Instead, a new-user pamphlet about the importance of getting summer readings in on time, about how to check whether parameters, etc. are correct would, used in conjunction with bill-message warnings, obviate customer dissatisfaction.

The current situation, which only came to light last month when Boston Gas obtained a real reading and then messed up the payment of the appropriate rebate to Ames, makes users feel helpless and resentful, toward both the utility and the computer system. This is a feeling we can well do without, and a little "hot spot" designing by the computer folk at Boston Gas could easily have avoided its occurring at all.

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144 McBride Street
Boston, Ma 02130

Boston Gas

FOR BILL INFORMATION
CALL.....522-6000.

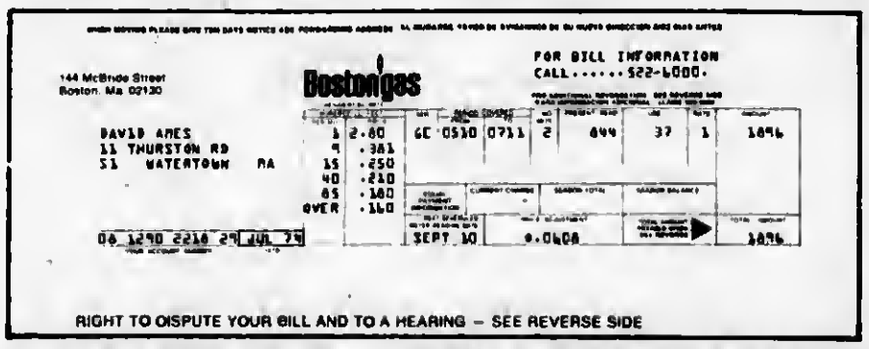
DAVID AMES
11 THURSTON RD
S1 WATERTOWN MA

1	2.70	GS 0301	0510	2	807	39	1	1940
7	.380							
15	.250							
40	.210							
85	.165							
OVER	.145							

08 1290 2218 29 MAY 74

JUL 11 0.0619 1940

RIGHT TO DISPUTE YOUR BILL AND TO A HEARING – SEE REVERSE SIDE



144 McBride Street
Boston, Ma 02130

Boston Gas

FOR BILL INFORMATION
CALL.....522-6000.

DAVID AMES
11 THURSTON RD
S1 WATERTOWN MA

1	2.80	GC 0510	0711	2	644	37	1	1896
7	.381							
15	.250							
40	.210							
85	.180							
OVER	.160							

08 1290 2218 29 JUL 74

SEPT 10 0.0608 1896

RIGHT TO DISPUTE YOUR BILL AND TO A HEARING – SEE REVERSE SIDE

The two bills above show where the Ames error started. The first bill of May '74 was based on actual usage, while the second was an estimate, based on secret parameters that the gas company had collected from a prior tenant's usage of Ames' apartment. Although there is space on the bills for appropriate warning messages about the use of these secret parameters and the need for customer assistance in gathering such data, Boston Gas made no attempt to give such messages.

Letters to the Editor

Comments Remind One Struggle Not Yet Won

When I read Thomas Mooshammer's solution to the problem of the underpaid female in DP – less brain, less pay – based on his implication that women have less intelligence [CW, Aug. 20], I was reminded of a former spokesman of his country – same theory, only the subhuman then was the Jew. Mooshammer's comments reminded me that the struggle is far from won.

As one woman DPer who was at first told not to pursue programming (by my male boss) because it was a "technical job requiring logical thinking" and thus not a suitable field for women; then was advised, after advancing through the ranks of programming, that I should "stick with programming because detailed work was women's work" rather than pursuing a job as a systems analyst where one required an ability to "see the broad picture;" then was told my several years of systems analysis experience didn't qualify me for a systems engineering job that required long hours and excessive travel, "too tough for a woman;" then was advised to forget about a management position in DP since "men wouldn't work for women;" then was advised against accepting a marketing position "in the plant" because of the harsh language I would be exposed to, "clearly not an environment for a woman;" then was barred from a national sales/marketing meeting because the president of the company felt I would "disturb the dynamics of the meeting;" now what I hear is that I should consider myself lucky because women and minorities "get all the good jobs even though they are not qualified."

Barbara McLean
Los Angeles, Calif.

Optimism Moderated By Male Chauvinist

I suppose *Computerworld* should be congratulated for publishing Thomas Mooshammer's attack upon the intelligence of women. It certainly served to moderate any undue optimism some of us have felt concerning the growth of human understanding or elementary fairness in employment in the computer industry.

On a more global scale, it served to remind us the land of Goebbels and Goering is still capable of producing gentlemen with equal insight into the use of scientific methods in sociological research.

At the same time, I wonder whether the editors of CW would have printed a similar comment on a religious, racial or ethnic subgroup in the industry. The fact that the editors saw fit to treat this letter as a joke is, in itself, the strongest comment they could have made on the treatment of women by the computer industry.

John Morris
Rome, N.Y.

Stepping Out of Line

As an inferior being, I hesitated to step out of line and respond to the feeble mutterings of Mr. Continental European himself, Thomas Mooshammer [CW, Aug. 20. However, my fighter's instinct (I undoubtedly have confused genes) rose to the fore to voice protest.

Goodness me – could it be that all these years in DP nobody has realized I must be less intelligent than all those around me, mostly men?

Perhaps I should resign, stay home and raise a tribe of baby boys.

Eileen Yardi
Goleta, Calif.

More Help, Please

The letter from Eric Weiss in the July 16 issue expressed the opinion that draft 12 of the PL/I standard is too abstract. Indeed it is – for the average PL/I programmer. However, the standard is not the programming language manual or a training document for an application programmer.

Weiss made the valid point that standards should be understandable and precise. The proposed standard was cited as being incomprehensible unless one first learns the special metalanguage, almost without reference to any prior knowledge of PL/I.

Unfortunately, Weiss did not identify who the reader of a standard should be. The primary audience should be the implementor and the various collections of PL/I experts in such places as the Share PL/I project. If the standard is also readable by the general public, it may be better, as long as ambiguity does not creep in to provide readability.

A few hours (or days) spent on the first chapter of the standard will clarify the metalanguage to any experienced PL/I user. Parts of the standard are particularly useful and relatively easy to read.

I hope someone can write a layman's introduction to standard PL/I for a more general audience. However, the need for such a book should not detract from the beauty of the definition of PL/I as one tree.

Wayne Compton
Dhahran, Saudi Arabia

PL/I Not Unusual

In my letter I objected to the proposed standard for PL/I because it was stated in such an abstract and algorithmic fashion as to be virtually incomprehensible.

In commenting on my letter, T.M. O'Leary and Dennis R. Allison [CW, Aug. 13] took the position that the basic issue is whether a programming language standard should be addressed to the implementor of the language compiler or the user of the language, the implication being that the implementor could understand the standard as proposed, whereas the user could not.

In my view, this is not the issue. Everyone will agree it would be ideal if a standard could be made clear and precise to everyone concerned. Therefore, the issue is whether it is possible to write a programming language standard clearly and precisely in a language and in a form which is understandable without resorting to an abstract and specially created metalanguage.

Certainly the committee members did not feel they were capable of clear and precise expression of the standard in English. I consider this to be an admission of inadequacy on their part and the appropriate action by the computing community is to reject the standard as incomprehensible and to charge and challenge the committee to produce a comprehensible one.

The creation of standards and their acceptance is a matter of significance to all of us. This standard, if adopted, will harm the general acceptance of PL/I and, as a precedent, will harm future language standardization efforts and standards.

Since the public comment period has ended for the draft standard [CW, Aug. 20], further public discussion may be academic. The Ansi X3 committee will consider the comments it has received, act on them as seems appropriate and prepare a final standards document for the approval cycle.

Consequently, the only actions open to those who might oppose the standard in this form is to convince their representatives on the standards approval bodies that approval should be withheld. Again, I urge those concerned to do so.

Eric A. Weiss
St. Davids, Pa.

Simplicity the Issue

The response to my request for information on the Cobol Report Writer [CW, June 18] has been highly stimulating.

The many informative letters printed in *Computerworld* have greatly broadened my outlook on the subject. My thanks to all those who have shared their thoughts on the topic.

Informative as these comments have been, I still plan to explore the Report Writer further. To this end, I would like to solicit detailed comments from programmers who are interested in Report Writer and who want to see the features improved. These should be addressed to me at: 1225 Sussex, No. 401, Montreal, Quebec, H3H 2A2, Canada.

My ultimate goal, should time and resources permit, is to compile and distribute a small handbook of Report Writer programming tips.

All comments are welcome, be they experiences, tips, techniques, pitfalls or what have you.

William B. Simmons
Montreal, Quebec

Not at All Astounding

The Aug. 13 issue contained yet another "astounding" software innovation by IBM. The announcement was entitled "IBM On-Line Payroll System Uses Two 3270s."

I wonder, what could possibly be the reason for anyone publicizing an on-line system, performing *one* function, requiring 150K and capable of handling only two terminals?

Long ago we provided such software for all IBM systems in no more than 49% the core requirements. In addition, the same core allocation would include 10 times the terminals, 3270 mapping, remote and local, full data base techniques, etc.

I don't question IBM's reason for publicizing any software they might evolve. However, since CW is the most widely circulated source of DP technology, I feel it would be its responsibility to notify its readers of other "popular packages" with a "packaged warranty."

Paul D. Doolan
Systems Engineer
Cincom Systems, Inc.
Los Angeles, Calif.

There are many performance evaluation tools... How do you decide which to use first?

It doesn't require a lot of money or complicated techniques to get started. The table at the right provides a good common sense approach.

Look at the bottom two rows. It is easy to see why over 400 computer installations are already using the Johnson Job Accounting Report System as the cornerstone of their performance evaluation programs. If you are a cost conscious manager, who must get the largest improvement for the minimum expenditure of dollars, job accounting has to be your first choice.

PERFORMANCE EVALUATION TOOL SELECTION GUIDE

If you have this system	Use These Tools				
	Job Accounting	Software Monitor	Small Hardware Monitor	Simulator	Large Hardware Monitor
370/125	✓				
370/135	✓	✓			
370/145	✓	✓	✓		
370/158	✓	✓	✓	✓	
370/168	✓	✓	✓	✓	✓
Cost	$5,000	+$10,000	+$15,000	+$30,000	+$50,000
Added Performance Improvement	20%	+10%	+10%	+5%	+5%

The Johnson Job Accounting Report System supports: OS, VS1, VS2, DOS, DOS/VS, and POWER/VS.

To get your P/E program off to a fast, cost-effective start, contact Johnson TODAY!

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NAME _____
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COMPANY _____
ADDRESS _____
CITY _____ STATE _____
ZIP _____ TELEPHONE _____
COMPUTER _____ OPERATING SYSTEM _____

2975

'Scert 76' Clocks Workloads, Job Mixes, Hardware

By Don Leavitt
Of the CW Staff

ROCKVILLE, Md. – The Scert 76 package now available from Comress enables users to simulate and, therefore, evaluate proposed system acquisitions, modifications to current configurations and anticipated changes in workloads for their systems.

Scert 76 produces cost/performance projections for any workload on any hardware software configuration, the vendor claimed. Users would find the projections useful in the areas of feasibility analysis, hardware selection, software selection and system design optimization, a spokesman suggested.

Implementation planning, configuration optimization and workload growth analysis could also benefit from Scert-based studies, he said.

The update is said to include support for automatic modeling, along with a versatile simulation language and a built-in library of performance factors. The standardized reports normally provided can be extended to include user-defined formats.

Scert 76 is organized into six modular subsystems. The 90K Scribe input management system backs initial organization of all input data on a presimulation library of workload models – generated manually or automatically – and hardware configuration models.

Scribe also includes a factor library, a separate data base of hardware and software performance specifications. A systems-oriented language aids users in the manual definition of workload models, including model validation.

Working with job accounting data such as IBM's SMF output, the Scamp automatic modeling subsystem generates simulation-ready models of a user's workload and passes them to the presimulation library. It also generates analytical data describing the workload.

Data gathered by a hardware monitor can be input to Scamp at the user's option to provide "live" information leading to more accurate models, Comress noted.

The Score throughput analysis subsystem – in essence, the old Scert package – provides two separate simulation capabilities. The first is a discrete workload scheduling simulator that portrays the progress of any workload from input queue through execution to completion.

The Score algorithms are said to provide representations of almost any operating environment, including multiprogramming, multiprocessing, discrete real-time, direct access mapping, time-sharing, paging, virtual and hierarchical situations.

A statistical technique also available under Score is useful for communications environments including queue-point analysis, resource utilization and expected response time throughout the communications net, Comress added.

A mix analysis subsystem called Scale is described by Comress as a new concept in performance simulation. It is said to use models created under Score to provide a detailed analysis of any number of programs running under a fixed environment, pinpointing contention problems and optimizing job mixes.

The Scout reports management subsystem controls the postsimulation library and production of standard and user-defined reports.

A data base design analysis subsystem originally developed to work with IBM's IMS, Scims is currently being extended to work with most of the generalized data base systems on the market and is not yet available.

Written in Cobol

Much of Scert 76 is written in Cobol so it can be used on a range of CPUs, including IBM 360s and 370s, Univac 1100s and Series 70s, or NCR Century 200s.

Although Scims (the now delayed data base analysis subsystem) and Score require 150K or more memory, the smaller modules of the system can be run on any user machine with results moved to a big system when it is available.

Scert 76 is available now for $28,000 for a one-year term, $38,000 for two years or $58,000 for three. Training, field support and updates are included in the cost, Comress said from Two Research Court, 20850.

VCI Enhances Two Packages

CHERRY HILL, N.J. – IBM DOS and DOS/VS installations can now consider a series of enhancements to two packages from Value Computing, Inc. (VCI).

Both System I – for job-accounting and hardware-performance reporting – and Comput-a-charge – for hardware utilization and accounting – have been improved, the vendor said.

Included in the modifications for the DOS shops are a periodic report program, an expanded daily job activity listing, a daily shift summary and an expanded daily shift report.

The periodic report program provides on a weekly, monthly, quarterly and year-to-date basis, and in graphic format, allocation times for "pooled" devices – peripherals which may be shared by and attached to more than one computer.

The daily job activity report has been expanded to include both partition identifications and number of phases processed, VCI said.

A daily shift summary has been added to provide upper management-level information including prior week and month daily averages for such things as runtimes, number of jobs handled and idle times, by shift.

The daily shift report provides an overview of a full day's production and an analysis of each shift's operations. This report has been expanded to break out jobs into as many as eight categories, such as production work, tests, reruns and abnormal terminations, and to show number of jobs, elapsed time and percentage by shift.

Current users will be provided the updated versions free; the packages are available to new users for $5,500 (for System I) and $7,500 (for Comput-a-charge).

VCI is at 300 VCI Building, West Marlton Pike, 08034.

Multiuser/Multithread Option Now Available for System 2000

AUSTIN, Texas – IBM OS- and OS/VS-1-oriented users of the System 2000 data base management system can now add flexibility to their environments with a multiuser/multithread capability just released by the System 2000 vendor, MRI Systems Corp.

The multithread feature works in conjunction with the multiuser capability and is designed to support installations where teleprocessing or batch demand rates exceed the throughput capabilities of the standard single-thread system, MRI said.

The multithread feature queues transaction input and user output and controls the concurrent processing or multiple System 2000 updates and retrievals, the company explained.

The number of threads is user-controlled and is based on demand rate, core availability and peripheral storage considerations. Currently the feature can support 16 users in nine concurrent processing threads, MRI said.

The primary design objective of System 2000 multiuser with multithread is optimal utilization of resources, the most critical resource being time. System 2000 creates minimum control program overhead and facilitates control of sharable resources, including those involving external devices, user tasks or sharable System 2000 resources, the company said.

Safeguards against deadlocks – which might occur if multiple concurrent users attempt to update the same data element – are built into the multiuser/multithread logic.

The number of threads, users, buffers, shared work files and concurrent data bases to be handled by a given system generation is established at initialization time. If the multithread feature is not installed at a site, the multiuser capability operates in a single-thread environment.

The multiuser/multithread feature is currently available for IBM 360/370 hardware under OS/MFT, OS/MVT and OS/VS1. It costs $20,000 in addition to the $30,000 charged for the basic System 2000 package itself.

MRI can be reached through P.O. Box 9968, 78766.

Data Listed, Cross-Referenced

NEW YORK – The Automatic Data Dictionary from Base Information Systems, Inc. simplifies control and maintenance of programs and data elements used in an installation's systems as well as maintenance and updating of associated documentation.

Using programs written in "virtually any Assembler or higher level language" as input, the dictionary is capable of generating a range of indexes and thesauri at the user's option.

The output cross-references programs and data in nearly any way an installation might find useful, Base said.

A user can determine, for example, what modules an entire application system contains or – by contrast – what systems use a given module. The dictionary can also show what systems or what modules use a given data element.

Other output possibilities would indicate what files are used in a system and what the specifications of a given file are. The variety of output should ensure users can anticipate the effect a change in a data element, a file or a module might have throughout an installation.

The software is both machine- and language-independent and can be adapted by Base to function in various hardware and software environments, the vendor claimed.

Currently installed on both IBM 360 and 370 CPUs under DOS, the dictionary utilizes 80K bytes of main storage, four tapes and a disk on the 30, Base said.

Purchase price is from $10,000 to $15,000, depending on options selected, and the package is currently available in object form from Base at Suite 1850, 380 Madison Ave., 10017.

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'DOS Jars' Enhanced to Include Links To Accounting Records From Power/VS

McLEAN, Va. – Managers of IBM DOS sites and their end users can gain insights into how their system is working – and what the work is costing – with the latest version of the DOS Job Accounting Report System (DOS Jars II) from Johnson Systems, Inc.

An enhanced version of the original Johnson Systems' package that utilized data collected by the Job Accounting module of DOS by IBM's Power, Universal Software's DOS/Asap or Software Design, Inc.'s Grasp, DOS Jars II now also interfaces with the event-oriented accounting file introduced by IBM with Power/VS.

Paging rates by job, program, partition "and even time of day" will be available to users through this newest interface. So will job turnaround statistics, measurement of I/O queue times, remote job entry line usage and utilization trend analysis for operations management, Johnson said.

Other enhancements in DOS Jars II include support for debit and credit entries, a budget control feature, selection and rejection of accounting records based on user-defined criteria and the ability to bill different jobs and job classes using different rate algorithms.

Version II also includes more than 50 new computations to determine such things as average CPU time, average elapsed time and a range of I/O indexes which are available for display on user-designed reports.

With the capabilities now in DOS Jars II, users are said to have better cost control logic than available previously and good support to evaluate software and hardware changes.

Specific application areas in which DOS Jars II can provide effective cost control and evaluation of hardware/software changes include, in addition to job accounting, budget control, resource utilization analysis, throughput analysis and job scheduling, a Johnson source suggested.

DOS Jars II can be run under DOS and must be under DOS/VS in order to utilize the Power/VS interface. Since the package generally uses preexisting data collection routines, the only storage requirements it has are during data reduction and reporting steps, and those are minimal, the vendor said.

DOS Jars II is available for $3,000. The Power/VS Interface costs an additional $1,000. Johnson Systems is at the Grant Building, Westgate Research Park, 22101.

NCI Upgrades Data Base Utility

ATLANTA – Users of Cincom Systems' Total data base management system will find more capabilties to support their data base operations in an updated version of the Total Utility Maintenance System (Tums) now available from National Computing Industries (NCI).

With Tums Version 3, users can operate in batch or multiple-step processing mode. The utility will consecutively process any number of functions on as many data sets within a data base as desired in a single pass, NCI claimed.

Tums 3 prints a job-accounting report at the end of each job step. The report shows the date; start, stop and elapsed time; return code for OS users; and counts of good, error and total records.

For DOS users, Tums is said to be capable of processing any number of blocked or unblocked input or output tape files in sequence without rewinding at end-of-file markers. This allows the user to process multifile volumes, NCI noted.

The series of potential error messages generated by Tums 3 is more extensive than with prior versions of the utility. There are now more than 100 such messages, but the routines that produce them require only 2K bytes of memory, a spokesman added.

Tums 3 is said to support all current versions of Total for both DOS and OS installations. The user's version of Total is now a parameter in the CALL to Tums and, since it is user-accessible, installations operating with two versions of Total gain, in effect, two utility packages in one, NCI said.

Purchase price of Tums 3 is $3,450, the vendor said from 6075 Roswell Road, 30328.

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'Safeguard II' Eases Security Burden

ALBANY, N.Y. – IBM 360/370 users working under any of the current operating system environments may find data encryption/decryption less of a system burden than before with the Safeguard II package now available from Computer Linguistics, Inc. (CLI).

Safeguard II is a significant extension over its predecessor because its code is both reentrant and relocatable, CLI said. Thus a single copy of the program logic may be resident and shared by multiple users simultaneously.

Both the new and the old Safeguard packages utilize nonlinear encryption algorithms, and knowledge of the specific encrypting key is required. Even detailed knowledge of Safeguard's logic and an accurate picture of the encrypted text is not enough to break the cipher.

Safeguard II, like its predecessor, utilizes a 16-character key (of printing or nonprinting characters) to control the encryption/decryption process. Pseudo-random numbers are generated from this key under control of the system's basic algorithm and these, in turn, create the encrypted text or convert coded text into clear data.

All data types and full or partial fields and records may be processed, CLI said.

Safeguard routines are written in Assembler and can operate on either IBM 360s or 370s, independent of the operating system in use. Thus a single package will function under DOS, OS, TSO, VS1, VS2, CMS, CICS and IMS, a spokesman claimed.

Safeguard II requires about 1,000 bytes of main memory and the overhead imposed by the encryption/decryption process is said to be about 550 nsec/char. on a 370/158.

Safeguard II is licensed for use on a specific CPU and is distributed in object code for a one-time fee of $650. Source code is available for $950, CLI said from 24 Aviation Road, Computer Park, 12205.

'Panda 3' Takes Over Disk Chores

OAK BROOK, Ill. – IBM OS and OS/VS users are relieved of the need to analyze and then act on reports of disk-oriented data set usage with Version 3 of Panda, the disk analysis and data set management package available from Pansophic Systems, Inc.

The older Panda was a "superlist" volume table of contents (VTOC) utility, in the vendor's words, but Version 3 now performs many of the chores its reports show are needed.

The user has override capabilities, however, for situations where an otherwise reasonable housekeeping action might be inappropriate.

Panda 3 will now scratch or uncatalog any data sets that have run past their retention cycles or do not conform to user-defined data set naming conventions.

The latest Panda will check partitioned data sets (PDS) to see if compression is needed and, if it is, will proceed to perform the compression. The system will bypass those PDS that don't need to be compressed, the spokesman emphasized.

For protection against system malfunctions while compression is underway, Panda 3 temporarily copies each PDS to be compressed, releasing the copy only after the compression has been successfully completed, he added.

As part of its track map function, Panda 3 informs the user of inaccurate Format 5 labels and utilizes operating system software to reclaim the space.

In addition to the previously available disk use reports by user, track and volume, an operator can specify multiple volumes to be put onto one report.

Other features of the Panda update include support for the latest IBM OS/VS release and for the IBM 3340 data module, as well as Model DSCB support.

On a perpetual license, Panda 3 is available for $2,400.

Pansophic is at 709 Enterprise Drive, 60521.

8080-Based Systems Gain Multitask 'Exec'

PONTIAC, Mich. – Tri-Systems Engineering Co. has a multitask real-time executive program for Intel 8080-based microcomputer systems.

The executive, called MTE-80, is said to provide for easy implementation of complex sequencing and scheduling problems, a capability previously found only on larger minicomputers and up.

Features of the $850 MTE-80 include interrupt I/O for standard peripherals, a set of exec functions and a feature to allow time-sharing between active tasks, Tri-Systems said from 2312 Greenlawn Ave., 48053.

Can a Fortune 100 company that builds kitchen ovens, missile systems, freezers and nuclear power plants give you state of the art intelligent terminals? You bet your CRT it can

THE WORD IS GETTING AROUND.

RAYTHEON DATA SYSTEMS RAYTHEON

Telenet Lays Question of VAN Regulation at FCC's Door

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – Now that Telenet has begun operation of its packet-switched common carrier service, users can make some evaluations of the cost of this type of "value-added network" (VAN).

Although Telenet is the first regulated VAN, Tymshare has operated a similar service for some time on a nonregulated basis. The major difference in the two approaches is that Telenet customers pay their charges under a tariff filed with the Federal Communications Commission (FCC); Tymshare users pay their rates under a contract signed with the company.

Analysis

The FCC has been considering whether VANs should be regulated for some time, but has not yet arrived at a decision. Telenet assumed from the start it should be a regulated carrier and made the necessary applications to the FCC.

Tymshare, realizing it might be required to file a tariff to operate its packet-switched service, has said it would do so if ordered.

But the effects of carrier vs. noncarrier status on the user have never been clear. Some information is now available from Scientific Time Sharing Corp. (STSC), the first Telenet user [CW, Aug. 27]. In addition to being the first to operate under the Telenet tariff, STSC has also used the Tymnet service. The comparisons are interesting.

Tymnet uses 1960's technology, while Telenet uses more modern equipment, according to John Myrna, STSC communications manager. He described the Tymnet facilities as very slow and too expensive for use on his APL Plus service.

STSC was paying $6.50/hour to Tymshare to operate on the Tymnet network. But the company has recently restructured its rates, which Myrna thinks may have been prompted by the advent of Telenet service.

In any case, Tymnet rates are now similar to AT&T high/low density charges. This means rates are lower in high-population areas and higher in low-population areas.

Under the restructured Tymnet rates, Myrna said he would have to pay about $4.50/hour of connect time. But this is still double the rate of $2.28 which he estimates it is costing STSC on the Telenet system.

A Tymshare spokesman said his com-

(Continued on Page 16)

First Telenet Tariff Based on Data Quantity

WASHINGTON, D.C. – The first tariff filed by Telenet Communications Corp. gives users a schedule of rates that is based on the amount of data transmitted instead of a per-mile or distance-sensitive rate.

The basic charge is 60 cents per kilopacket, or 1,024 bits of information, transmitted by the user. In addition, there are various classes of access points or ports at which the user enters the Telenet network. These access ports can be either dial-up or dedicated, and the charges are based on the speed of service used.

Public dial-in ports are available at one rate from 110- to 300 bit/sec at $1.40/hour in high-density areas, which include the seven initial cities being served. This rate applies for the first 1,400 hours, after which it drops to 90 cent/hour.

Private dial ports are available at speeds from 110- to 4,800 bit/sec and range from $100- to $400/mo in the initial cities served.

Up to 300 bit/sec, the rate is $100 plus a one-time installation charge of $200. The private dial ports "are available . . . for the exclusive use of a particular customer," Telenet said.

Leased channel ports are available at speeds from 50 bit/sec to 56 kbit/sec at rates ranging from $75- to $200/mo plus an installation charge. These access channels generally cost the same as existing Bell or other rates under DDS or private line services.

Users who have leased channel or private dial ports also pay a minimum monthly multiple connection charge (based on 50 connections) of $200. This rate is determined by the number of peak simultaneous connections through the port each month.

A Telenet access controller installed at the user's site costs $400/mo plus an installation fee of $600. In addition, the user pays a monthly charge for an access port to the controller based on speed from 50- to 1,200 bit/sec. This ranges from $25- to $50/mo.

Initial cities served by Telenet are Boston, New York, Washington, D.C., Chicago, Dallas, Los Angeles and San Francisco. The carrier is at 1666 K St. N.W., 20006.

Mailgrams From Users' Tapes Speed Messages

MIDDLETOWN, Va. – Computer-originated Mailgrams are being used for a variety of business transactions such as collection of delinquent accounts, corporate announcements, new product announcements, price changes, product recalls, name changes and moves, sales promotion, invitations to meetings, shipping schedule changes and proxy solicitation.

Major users of computer-originated Mailgrams include Shell Oil, Phillips Petroleum, Master Charge, BankAmericard, Publishers Clearing House and National Aviation Underwriters.

Computer-originated Mailgrams can be sent in three ways:

- From a company's computer or key-to-disk system that is equipped with a special program and a communications controller.
- From 27 special Western Union offices which accept bulk messages on computer tape produced either by a company's computer or key-to-disk system.
- From over 100 computer service bureaus which produce computer tapes from message material and address lists provided by a company for acceptance at one of the Western Union transmission centers.

Companies can prepare bulk messages on their own computers, on the key-to-disk sysems of such manufacturers as Inforex, Mohawk, Singer, Sycor and Datapoint or on a Datatype optical scanner for direct transmission.

The key requirements are that they be equipped with a communications controller for transmitting a binary synchronous mode and that they produce a computer tape in Mailgram format acceptable to the Infomaster Mailgram program. Western Union offers the software package for this purpose free of charge.

This software program enables the user to produce a tape which can be read by the Mailgram processing program. What the program does is check the format of messages and addresses, labels and organization of files and check the arrangement of files where more than one file is contained on a tape.

At the same time, it generates the necessary control information to activate the Infomaster switch for journaling, queuing, routing and transmission.

The Mailgram system will accept input data on 9-track, 800- or 1,600 bit/in. tape in Ebcdic, Ascii or Ecdic.

Three Alternatives

With the program, companies can prepare a formatted tape or data file (on- or off-line) on their mainframe or key-to-disk system, then dial up the Infomaster Center here and transmit all the necessary information over the dial-up phone network.

A second alternative is for companies to send computer-originated Mailgrams by delivering or shipping a tape containing text material and their addresses to one of Western Union's 27 transmission centers which operate 24 hours a day, seven days a week.

At these acceptance points, a Digital Equipment Corp. PDP-8E equipped with two lomec tape drives transmits each tape over 2,400 bit/sec private lines to the

(Continued on Page 16)

McNitt to Keynote TCA Meet

WEST COVINA, Calif. – "Telecommunications – Beacon to Bits" will be the theme of the 13th annual conference and exposition of the Tele-Communications Association (TCA) in San Diego Sept. 23-26.

Keynote speaker will be Gen. James R. McNitt, president of ITT World Communications, Inc.

Six workshops slated for the conference will include a presentation for data communicatlons administrators, a nuts and bolts description of how data is transmitted over communications lines, a discussion on the utilization of the domestic specialized carriers, a seminar on "Intelligent Terminals in Telecommunications" and a session titled "Trends in Regulations."

The "Trends in Regulations" session will include a discussion of the types of telecommunication regulatory trends that affect costs. Panel members will be Bernard Strasburg, retired chairman of the Federal Communications Commission's Common Carrier Bureau; Gerald Hellerman, special financial advisor to the U.S. Senate Subcommittee on Antitrust and Monopoly; Tom Keller, general counsel of the U.S. Office of Telecommunications Policies; and Ernest Garfield, commissioner of the Arizona Corporation Commission.

About 100 companies are expected to exhibit their products. Information on the conference is available from TCA 1975 Conference, 424 S. Pima Ave., 91790.

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Mailgrams From Users' Tapes Speed Business Messages

(Continued from Page 15)
Infomaster center.

A third alternative is for companies to use the services of a computer service bureau for the preparation of the tapes. Over 100 service bureaus have been certified for this purpose.

Service bureaus will keypunch material from raw data or produce a Mailgram-formatted tape from an original name and address tape.

Provision has also been made to generate a magnetic tape in a format acceptable to the processing program from customer data on punched cards. Such card input must be in the correct format for processing by the Western Union card-to-tape program, written in Cobol to allow use on a broad range of mainframe configurations.

The card-to-tape program is available without charge for customer use, as are compatible instruction manuals for either customer tape or punched card input formats.

Interface Receiver

Enroute to the serving post office nearest the addressee, messages go through the Infomaster center where Mailgrams are received on another PDP-8E acting as an interface receiver.

The tape is then entered off-line into a Univac 1108 which performs a preprocessing function, verifying Zip Codes and format, creating a message queuing tape for transmission and printing out billing information for the transaction.

The tape generated from this preprocessing is then fed into a second Univac 1108 which automatically routes and delivers each Mailgram message by store-and-forward techniques based on Zip Codes to the post office nearest the addressee. All Mailgrams on a computer tape are sent out simultaneously.

At the output side are 121 serving post offices. These are classified according to light, medium or heavy traffic volume.

Forty heavy-volume offices are served by dedicated circuits from Infomaster, operating at 2,400 bit/sec. These circuits connect, through PDP-11 processors operating as controllers, to a minimum of two Data Products 2310 line printers, each capable of processing 800 messages an hour.

Low- and medium-volume post offices are linked to Infomaster by dedicated 110 bit/sec lines feeding 100 word/min receive-only teleprinters.

Communications Courses Offered

NEWTON, Mass. – Planning and implementing effective data communications systems and advanced teleprocessing systems analysis and design will be the main themes of two seminars being offered this fall.

The courses, sponsored by The Conference Company, were prepared by ICC Institute and Dr. Dixon Doll, a leading teleprocessing consultant. They will be held in several cities between September and December.

Data Communications Course No. 1010 is a two-day seminar intended to provide attendees with a comprehensive exposure to the terminology, economic aspects and functional characteristics of contemporary data communications devices, techniques and systems.

The faculty, led by Doll, will examine the latest communication developments, including Synchronous Data Link Control (SDLC), the principles of operation and prices for Dataphone Digital Service (DDS), HiD-LoD and the impact of satellite and specialized carriers.

Course No. 1020 is designed for professionals who want an in-depth familiarity with the techniques for planning, designing and managing cost-effective commercial data communications networks. This seminar assumes a degree of experience on the part of attendees.

One particular feature of Course No. 1020 is the opportunity for attendees to present their organization's problems for study and discussion by the instructors and class members.

The three-day course covers all practical aspects of data network planning analysis and design quantitatively. It considers both on-line and batch-oriented nets using dial-up and leased lines, as well as multiplexers and concentrators.

The registration fee for Course No. 1010 is $350 and $450 for Course No. 1020.

Further information is available from The Conference Company at 797 Washington St., 02160.

VAN Regulation Issue Left at Door of FCC

(Continued from Page 15)
pany is studying the initial tariff filed by Telenet. "We intend to be competitive with the Telenet rates," he said, but specific comparison cannot be made until Tymshare has had a chance to become familiar with the Telenet rate structure.

The issue of whether packet-switched services should be regulated is before the FCC as part of Docket 20097, titled "Regulatory Policies Concerning Resale and Shared Use of Common Services and Facilities."

The VANs use conventional lines from AT&T and others and add "value" to these facilities. In the case of packet-switched services, this added value is made up of software that rearranges a customer's data for more efficient transmission over the communications lines.

Tymshare believes this is simply the sharing of common facilities among a group of users. Telenet thinks this is a service that should be regulated and provided by a common carrier.

Probably a third option would be to allow both situations to exist, as is now the case with Telenet and Tymshare.

It is not clear yet which method provides the communications user with the best service, under the most stable conditions and at the lowest rates. That is an answer that the FCC will have to determine.

Current estimates are that the commission will make a ruling sometime this fall. In the meantime, users can pay their money and take their choice.

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Data General Europe, 15 Rue Le Sueur, Paris 75116, France. Data General Australia, Melbourne (03) 82-1361/Sydney (02) 908-1366.

Credit Reporting Service Finds

Mix of Line Facilities, Gear Keeps Net's Downtime Low

By Ronald A. Frank
Of the CW Staff

ANAHEIM, Calif. – When a data communications network handles 15,000 inquiries per hour, downtime must be kept to a bare minimum. One way to assure a reliable network is to select a mix of efficient line facilities and equipment, and that is what TRW Credit Data has done.

The company operates a nationwide consumer credit reporting service that provides information to department stores, finance companies, savings and loan organizations and other businesses which extend credit to customers.

About 7,000 subscribers depend on TRW for credit reports that are sent to more than 22,000 locations around the country. Many of these locations operate on-line to the firm's central data base of consumer credit records here.

The network operates with three types of remote city configurations. The configurations are based on the amount of inquiries handled in each area, but each has equal priority in accessing the credit records.

In lower volume areas, subscribers use teletypewriters which are connected over dial-up lines to a Comten 3670 concentrator. The 3670 acts as a store-and-forward device and transmits the credit inquiries to Anaheim at 4,800 bit/sec.

In higher volume cities, TRW subscribers have Datapoint 3360 CRTs which use a Hewlett-Packard 2114B processor to concentrate the data and transmit it to the DP center at 4,800 bit/sec.

For customers without their own terminals, a call is placed to a local TRW site where operators take the inquiry information and enter it into Raytheon PTS-100 CRTs. These terminals then operate on-line to Anaheim at 2,400 bit/sec.

Terminal Transactions

The network includes Codex and International Communications Corp. modems. In some cases, split-stream modems on a 7,200 bit/sec line operate with a 4,800- and 2,400 bit/sec circuit, each handling a separate credit operation.

The network also includes Timeplex and Tel-Tec multiplexers. Most of the lines are Bell 3002-type with C-2 conditioning, but the net also includes one Telpak circuit in California.

"Without question, one of the biggest problems [in running a nationwide network] is keeping a data line up," according to Ray Ybaben, TRW vice-president.

Anyone going into data communications has to plan for a data line going down and there must be an altemate facility. There is about an hour of downtime, usually due to line malfunctions, in the network each day, he said.

In the early days of the TRW network each site had to have two lines in case the first went down. But now, with the improvement in modems and the reliability of the dial-up network, the credit service can rely on dial-up facilities for backup.

But this is not low-cost. An hour of dial-up operation between New York and Los Angeles can add $100 to the TRW monthly phone bill, Ybaben said. One reason is that two dial-up calls must be placed to establish a four-wire connection as a backup circuit.

The data base at the Anaheim DP center runs on dual 370/158s which operate under CICS. But the TRW software staff has developed its own multitasking control program which is slowly being phased in to replace the IBM software, according to Paul Palermo, TRW director of software services.

The data base is contained on IBM 3330-11 disks and contains files on an estimated 50 million consumers. Peripherals also include 24 IBM and Storage Technology Corp. tape drives shared between the 158s and a Model 155 that is used as the backup system.

The network includes 35 high-speed and 453 low-speed lines; data transmission is controlled by five Comten 3670 processors. Response time ranges from "three to 10 seconds" and the network operates 17 hours each day.

TRW pays about $35,000/mo for lines and $10,000/mo for modems, Ybaben estimated. But the system is like a moving target, having added 10 new cities in the past two years, and new lines are being added all the time.

The ABZ's of DBMS

A special supplement on Data Base Management Systems in the September 24th issue of Computerworld.

Data Base Management Systems are the subject of widespread interest in the DP community today, and they will be the subject of this special supplement in *Computerworld*. We'll be examining many aspects of Data Base Management in detail, with special emphasis on the applications that are best suited to Data Base Management. You'll see articles, tutorials and applications stories on topics like these:

- **When to use a Data Base Management System vs. another approach**
- **Applications best suited to Data Base Management**
- **Matching functional capabilities and system features to specific types of applications**
- **The advantages and disadvantages of using a network's Data Base Management System vs. an in-house system**
- **Danger Signals - things that can go wrong, and what to look out for in particular**
- **The benefits of Data Base Management vs. alternative approaches**
- **What's to be said for designing your own system, versus using a package**

If you have anything to do with Data Base Management, you should be reading this special supplement in the September 24th issue of *Computerworld*. And if you're a marketer in this field, your ad should be there. Closing date is September 4th. Contact your area *Computerworld* salesman for complete details. Or, call Judy Milford or Sara Steets at (617) 965-5800.

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Programmable BDTS Exercises Systems

MOUNT LAUREL, N.J. – The Spectron Corp. buffered data transmission simulator (BDTS) is a programmable message generator for exercising data communications systems.

System installation and repair time is reduced by testing modems, terminals or controllers with actual polling sequences under simulated operating conditions, the vendor said.

The BDTS may be used to debug hardware and software by testing new communications protocols on-line without the need for CPU time. Data streams may be stored in 1,024 bytes of customer specified read-only memory (ROM) and/or 1,024 bytes of random-access memory (RAM).

Transmission may be synchronous or asynchronous, from 5- to 8 bit/char. and at any of 16 standard communication rates, using internal clocks or at any speed using the modem clock.

The BDTS may be used as a stand-alone device or in conjunction with the Spectron Datascope. In the latter configuration, the BDTS generates data patterns to exercise the equipment under test while the Datascope records and displays the performance.

Price of the BDTS is $1,850. Delivery is 30 days from the firm at Church Road and Roland Ave., 08057.

Let CW Share Data Entry Triumphs

October is data entry month at *Computerworld*. And the Special Report in the Oct. 29 issue will cover the wide spectrum of data entry with heavy emphasis on remote data capture.

You don't have to be a professional writer to tell of your installation or application in CW. If you believe your installation or application is unique and cost-effective, just write us a long letter (three or four typed pages, double spaced) and explain what you had before, what you have now, why you changed, the advantages of the new system and just how effective the change was from a cost or time savings point of view.

Pitfalls identified or overcome are always interesting, as are recommendations to other users who may embark on the same course.

Our team of editors will take it from there.

If you're not sure of just how interesting your story is, send a short note to Associate Editor Vic Farmer or Assistant Editor/Systems Patrick Ward, who are putting the report together.

One of the most popular stories in CW is just this sort of application story.

CW is at 797 Washington St., Newton, Mass. 02160.

3350-Compatible

STC Adds Fixed-Disk Units

By Patrick Ward
Of the CW Staff

LOUISVILLE, Colo. – Storage Technology Corp. (STC) has boosted the linear bit density of its 8400 and 8800 fixed-disk drives to offer IBM 3350-compatible storage at a cost up to 50% lower than the IBM product, according to STC.

The STC models take a different path from the recently announced California Computer Products (Calcomp) 235-4, which employs 700 track/in. technology to provide 400M byte per spindle storage [CW, Aug. 20].

STC has also announced an IBM 3350-equivalent 317.5M-byte drive, the STC 8350.

It costs about 15% less per month than the IBM device, STC said.

The newly announced STC 8450 and 8850 drives emulate two and four 3350s respectively. They use the "quad pack" design of the company's current 8400 and 8800 fixed-disk models to provide the effect of a single, 60-platter spindle, an STC spokesman said.

The 8450 and 8850, however, have 50% higher linear bit density at 6,425 bit/in. to provide 635M-byte- and 1,270M-byte storage respectively. The 8400 and 8800 provide 400M bytes and 800M bytes.

The STC 8450 and 8850 use the same 238 track/in. ratio used on the 8400 and 8800. Both the 8450 and 8850 provide a 1,198 kbyte/sec transfer rate, the firm said.

The currently available 8400 and 8800 models can be field upgraded to 8400s and 8450s in late 1976, STC said.

In a comparison of a one-controller, eight-drive IBM 3350 configuration against a one-controller, four-drive STC 8850 system, an STC spokesman said 1M byte of storage would cost $3/mo on the IBM 3350 and $1.55/mo on the STC 8850.

STC said the 8450 and 8850 are primarily aimed at users that have low-activity disk drives, new applications that have heretofore been unjustified because of the costs of on-line storage and tape data set migration.

All the STC drives will attach to IBM 370 Models 135 and above and can be interfaced through the STC 8000 disk control unit. A single controller can intermix 3330-equivalent STC 8100s, 8350s, 8400s, 8450s, 8800s and 8850s, STC said.

Two-year lease prices are approximately $500/mo for the 8350 drive; $955/mo for the 8450 and $1,485/mo for the 8850. Customer shipments are sheduled for the fourth quarter of 1976 from the firm at 2270 S. 88th St., 80027.

CFI, IBM Score High in Datapro Media Survey

DELRAN, N.J. – CFI Memories, Inc., won the highest user satisfaction ratings of any disk pack vendor, and IBM led the list of tape suppliers in a recent survey by Datapro Research Corp.

Datapro had responses from a total of 318 users of DP media and supplies. The respondents reported their overall experience with the various brands of supplies by assigning a rating of excellent, good, fair or poor to each vendor's products.

Nine brands of disk packs were rated by 10 or more users, and all nine earned high ratings. CFI Memories amassed a weighted average user rating of 3.7 on a scale of 4 for excellent, 3 for good, 2 for fair and 1 for poor.

IBM, Memorex, 3M and Wright Line all tied for second place at 3.6, and they were followed closely by Caelus (3.5), BASF (3.4), Control Data (3.4) and Nashua (3.4).

The survey also brought responses from IBM 3348 data module users who gave their removable disk packages a 3.7 score. Thirty out of 39 respondents rated the product "excellent," Datapro noted.

Among magnetic tape suppliers rated by 10 or more users, IBM was ahead with a weighted average score of 3.8. Graham and 3M tied for second place at 3.6, followed by BASF and Memorex at 3.5.

Among the vendors of printer forms rated by 10 or more users, Duplex Products earned first place with an average rating of 3.7, followed by Shade, Inc. (3.5), Data Documents (3.4), Moore Business Forms (3.4), Standard Register (3.3) and Uarco (3.2).

Jersey Tab Card received top honors among punched card suppliers rated by 10 or more users by earning an average rating of 3.7, followed by IBM (3.6), Data Documents (3.4), OEI (3.4), Pryor (3.3) and National Electronic Card (3.2).

Moore Business Forms and Codo Manufacturing Corp. shared 3.7 ratings to lead the printer ribbon suppliers. Burroughs and IBM followed with 3.5 scores. Aetna Products Co., Columbia Ribbon and Carbon, Data 100 and Kee Lox Manufacturing Co. shared the next highest score of 3.3.

Memorex led floppy disk vendors with 3.7 score; IBM trailed closely with a 3.6 and Wabash came third with 3.3.

MSI Data Corp. led the list of magnetic tape cassette and cartridge suppliers with a 3.5 user rating, ahead of Sycor and NCR which had 3.0 and 2.3 ratings respectively.

These survey results are contained in "All About EDP Media and Supplies," a 30-page report reprinted from the August Supplement to *Datapro 70*. The report also includes comparison charts that summarize the product lines of 167 vendors.

"All about EDP Media and Supplies costs $10 per copy from the research firm at 1805 Underwood Blvd., 08075.

Ansi Publishes OCR-B Standard

NEW YORK – OCR-B, an alternative character set for optical character recognition (OCR) systems that is easier for human beings to read, has just been published as an American national standard by the American National Standards Institute (Ansi).

The widely used optical character set, OCR-A, has been in use for a number of years. Its emphasis is on optimum machine performance. OCR-B was created to give users a choice of readability between machines and people; its emphasis is on conventionality of appearance to make it easier for employees to work with OCR documents and records, Ansi said.

The American national standard for OCR-B has been approved by the U.S. secretary of commerce for use in acquisition of federal computer systems by the General Services Administration. It has been designated Federal Information Processing Standard 32.

Sizes, Shapes Set

The standard describes and illustrates shapes, sizes and printing positions of OCR-B alphanumeric characters and symbols. The character repertoire includes numerals, upper-case and lower-case characters and special symbols in one or more of three different sizes.

The standard was developed by a subcommittee on OCR of American National Standards Committee on Computers and Information Processing, X3. The Computer and Business Equipment Manufacturers Association (Cbema) holds the secretariat.

Designated American National Standard Character Set for Optical Character Recognition (OCR-B), X3.49-1975, the 60-page standard costs $9.75 a copy from the Sales Department, American National Standards Institute, 1430 Broadway, 10018.

Ansi describes itself as the clearinghouse and coordinating agency for voluntary standardization in the U.S. It approves a standard when it receives evidence that all parties having a substantial interest in a particular standard have been given an opportunity to cooperate in the standard's development or to comment on its provisions.

Tape Unit Interfaces HIS CPUs

MT. LAUREL, N.J. – The F383 magnetic tape subsystem from Formation, Inc. is said to be an automatic loading, fourth-generation tape system that is plug-compatible with Honeywell Series 200 and 2000 computers.

The F383 can function in eight Honeywell-equivalent modes, such as 7-channel (at 200-, 556- or 800 bit/in.), and 9-channel (800- or 1,600 bit/in. NRZ), and at speeds from 70- to 150 in./sec.

The F383 microprogrammed control unit can accommodate all modes and can control up to eight tape drives in a dual-channel configuration, with read-write simultaneity.

The system's software is compatible with Honeywell software, as well as being industry-compatible with S-6000, Ebcdic and Ascii tapes, Formation noted.

Rental of the basic F383 magnetic tape subsystem starts at $3,500/mo from the firm at 823 East Gate Drive, 08057.



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System Keeps Cash-and-Carry Operation Competitive

By Patrick Ward
Of the CW Staff

PROVIDENCE, R.I. – Computers may be leading to a cashless society, but they can help "cash-and-carry" stores compete in the retail marketplace, too.

For example, the four Brewsters cash-and-carry building materials stores in New England use an automatic invoicing system that provides management with current sales and cash information, eases price changes and inventory control and even gives salesmen more time to deal with customers, according to Stephen Maloney, vice-president of finance of Bridgton Distributing Co., which runs Brewsters stores.

Before Brewsters began using an in-house 32K Univac 9214 CPU in 1972, salesmen would write out their own invoices at the sales counter. This often required an adding machine and could take 10 to 20 minutes, including the time to figure taxes, Maloney recalled.

Now the process takes about 10 seconds, he said. Each store has two Uniscope 100 CRTs behind the sales counters. To invoice an order, the salesman keys in the number and quantity of the items his customer is purchasing and hits a button; the system prints out the complete invoice on a Centronics printer.

Brewsters can very easily change the prices of its items by updating files in the automatic invoicing system, Maloney noted.

The terminals in the Wilmington, Mass., Hartford, Conn., and Milford, Conn., stores are linked by 2,400 bit/sec lines to Brewsters headquarters here.

The computer center in Providence batch processes about 1,600 invoices a day during the week and about 2,500 on Saturdays. On a typical day, Brewsters may take in $100,000 to $125,000 in cash.

The system prints an updated inventory list each Friday, analyzing sales by item. However, Brewsters is working toward an on-line inventory system which will allow managers to inquire from terminals for information on quantities on hand and on order.

Additional Duties

The computer figures in Brewsters cash-and-carry operation in other ways, too:

- At mid-week, it provides a list of all accounts payable scheduled for payment and prints the checks each Friday, automatically figuring discounts. This complete voucher system accounts for all purchase orders, vendors and dates of payment.
- The computer is programmed with five methods of calculating sales commissions, depending on the store and salesman. It figures commission at the close of business each Friday.



The Univac 9214 at Brewsters' Providence office is still being used while the cash-and-carry operation switches over to a 90/30.

The 40 full or part-time sales people at all four stores are paid each week, and the computer includes the commission for the previous week when it prints the paychecks.

- The Brewsters pricebook is prepared from a computer printout of items and prices based on the inventory control system. The pricebook is then printed in about two days.

"The computer gave us immediate savings here," Maloney said. "We used to spend six weeks preparing and editing the initial proofs. Now we receive a printout immediately."

The 9214 also provides monthly printouts of financial statements for each store and supplies management with a monthly summary of the market value of the firm's total investment portfolio.

'Cards Out of Our Ears'

Brewsters had used a service bureau before installing the 9214. "We had cards coming out of our ears and had to crate them down to the service bureau," Maloney recalled.

The cost of the service bureau was runing close to the cost of a 9214 when the firm decided to bring in its own CPU, he said.

Brewsters will soon replace the 9214 with a 98K Univac 90/30 whose extra capacity will be able to support several additional applications, Maloney said.

Three Univac 8416 disk subsystems will provide about 88M bytes of storage. The shop will also have a 500 line/min Univac 0773 printer; a Uniservo 6C tape subsystem; a 500 card/min card reader; and a 75- to 160 card/min card punch.

In addition, the installation will include a communications adapter handling six full-duplex lines servicing a total of 10 Uniscope 100 CRTs.

The Brewsters communications application was developed by a Univac project engineer. Brewsters' own programmers developed the accounts payable, payroll and general ledger batch programs.

Rath and Strong, Inc., a consulting firm, provided the inventory and inventory analysis programs.

Brewsters is now offering its batch programs and techniques to other interested firms.

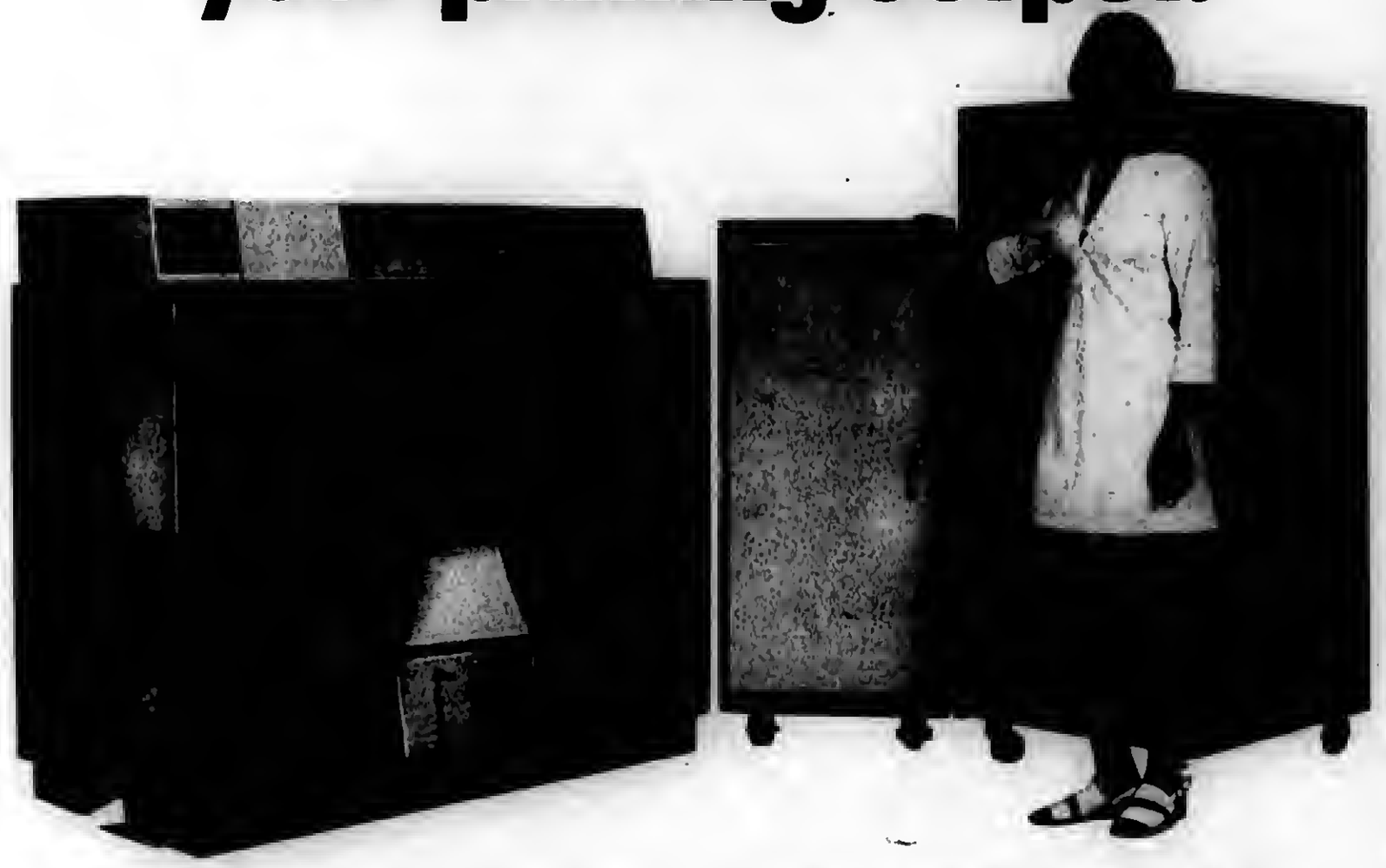
Maintenance Society Seeks New Members

WOODLAND HILLS, Calif. – The Association of Field Service Managers (AFSM) is seeking members from the managerial levels of firms engaged in the maintenance of computers or similar electronic gear.

The group hopes to provide a base of practical knowledge to improve the overall performance of the profession, as well as provide a means for the exchange of ideas.

Membership information is available from the AFSM, c/o J. Thomas Evans, 20501 Hatteras St., 91364.

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You can rent, lease or buy both the printer and controller. For full information, call or write Joe McDonough, Grumman Data Systems Corporation, 45 Crossways Park Drive, Woodbury, New York 11797. (516) 575-3034.

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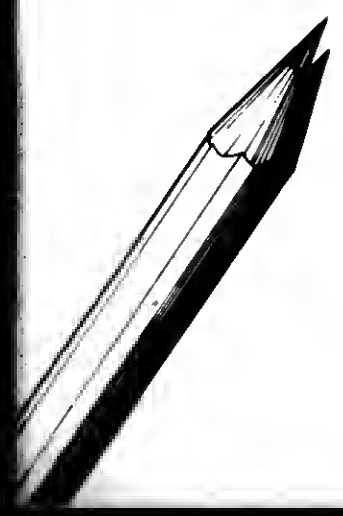
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Basic Nixdorf 8870 system includes one 10M-byte disk drive, line printer, CPU and terminal.

Nixdorf Combines U.S. Products As Basis of Turnkey Philosophy

By Vic Farmer
Of the CW Staff

CHICAGO – While the hardware is pretty standard, it is the operating system and promises of maintenance and software applications support that is sure to interest users looking at the Nixdorf 8870 minicomputer system.

The Nixdorf name on the nameplate is about the only thing on the 8870 minicomputer system that is German. Other than that, Nixdorf has managed to combine Digital Computer Control's CPU, Diablo disk drives, Data Products and Centronics printers, Hazeltine CRTs and Pertec tape drives into a typical business-oriented turnkey minicomputer system.

And, in a plant just outside of Chicago, it assembles and tests the equipment.

True, there is a good chunk of Nixdorf engineering in the system integration, but it is mostly the operating system that forms the goldplate around the basic iron. Nixdorf also supplies a German-made, 165 char./sec matrix impact printer as an option.

The operating system is designed to support interactive time-sharing and background processing simultaneously. Through the use of virtual memory up to nine CRT terminals can be added without increasing main memory size, according to the firm.

The disk-resident operating system allows for:

- On-demand dynamic disk allocations.
- Automatic terminal usage accounting system.
- Sequential, indexed, random and text-file processing.
- Automatic blocking and deblocking of data records.
- Automatic task scheduling.
- Program chaining.

The only language presently available is Business Basic; extensions include extended precision decimal arithmetic, data files, signaling, chaining, error branching, special functions and provision for large strings and arrays.

Applications packages are available for wholesalers, distributors, manufacturers, medical clinics and municipalities with standard functions ranging from sales analysis to general ledger and billing.

The basic configuration is a 48K-byte core memory CPU, a 10M-byte disk drive, 100 line/min printer and one CRT keystation. This costs $40,000 with software additional. Leases are availahle from a third-party lessor.

The maximum configuration has 64K-byte memory, two disk drives and nine CRTs with a printer capable of 600 line/min.

The disk drives are 5M-byte removable and 5M-byte fixed on the same spindle.

Nixdorf Computer Inc., U.S. subsidiary of Nixdorf Computer AG, is at Suite 365, O'Hare Plaza, 5725 E. River Road, 60631.

And Matrix Line Printer

Two Models Added to NCR 399 Line

DAYTON, Ohio – Two disk-oriented NCR 399 accounting computer systems, one featuring a matrix line printer, are available from NCR Corp.

These top-of-the-line models are designed for small and medium-sized businesses, as well as large firms with decentralized information processing requirements, NCR said.

The first model, the NCR 399-113, rents for $795/mo and has a purchase price of $31,800. It consists of a processor with 20K memory, one magnetic tape cassette handler and a disk unit with a storage capacity of 4.9M characters.

The second model, the NCR 399-114, includes the 20K processor, one cassette handler, a common trunk, the 4.9M-character disk unit and a 55 line/min matrix printer. This model rents for $925/mo and has a purchase price of $35,750.

Ledger Cards Optional

Use of magnetic ledger cards is available as an option.

Both models will he available for delivery in December.

Prices for the previously released hasic 399 system, which uses magnetic ledger cards or magnetic cassettes as storage devices, begin at $14,000 and range to about $26,000, depending on the number of peripherals ordered. The 399 can be used either as a free-standing system or satellite system.

The 4.9M-character disk unit used with the two latest 399 models is a modified version of the 9.8M-character NCR 656 disk unit. The larger capacity disk is also available as a peripheral for all 399 models.

The smaller disk unit, including integrated controller, is priced at $12,000.

NCR also announced the price of the larger capacity 656 disk unit has been redueed from $17,500 to $15,000.

The matrix line printer is a table-top, 132-column single-head impact printer. It prints at a rate of 173 char./sec.

The printer, which is available for delivery this month, can he added to currently installed NCR 399 systems. It sells for $4,995 and has a monthly rental of $160.

Three Similar Minis Target of Ticketing Task

GOTHENBURG, Sweden – Swedish ferry operator Tor Lines AB has installed a minicomputer system in each of its three ports of call in an effort to increase the load factor of its fleet of 10 ships and to minimize the time the ships spend in ports.

Tor Line operates eight freighters and two passenger ferries between its home port of Gothenburg, Amsterdam and the English port of Immingham. The passenger ships carried more than 270,000 passengers in 1974.

"With increasing loads, the earlier manual system for seat and cabin reservations, travel document preparation and check-in procedures became unwieldy," said one Tor Line official. "It resulted in low load factors and long port times."

With additional ferries set to begin service this year, the shipping line automated the system using minicomputers and data entry stations at ticket sales offices and check-in counters.

In order to get complete redundancy and minimize communications costs, identical minicomputer systems were located in each of the three countries involved. Should one system become inoperative, the other systems are still available through normal dial-up telephone lines.

Each system consists of a Hewlett-Packard dual-processor 2000F minicomputer with 23M bytes of disk storage and a 200 line/min printer.

The Gothenburg system is equipped with a 600 line/min printer. All systems have identical data bases which are updated automatically every night with each day's new data.

The newly installed systems, with Tor Line Passenger Administrative System (Topas) software, will be used initially for passenger reservations, to compile shipping statistics and perform administrative tasks. Applications will be expanded later to include the freight shipment operations, the firm said.

S/3 Users Meeting in Pa.

YORK, Pa. – The Central Pennsylvania System/3 Users Group is holding a two-day seminar on the System/3 in Harrishurg, Pa., on Oct. 28 and 29.

Twelve sessions will cover such topics as comparison of the System/3 models 8, 10, 12 and 15; data entry with cardless considerations; and teleprocessing.

Registration is $35. The users group can be reached through Box 174, 17405.

Vinyl Covers Protect System/3s

RUTHERFORD, N.J. – A durable, heavy-duty set of vinyl covers for the IBM System/3 is available from the S/3 Supply Co.

The covers are designed to protect against sprinkler system and other utility malfunctions.

Covers are available for all models of the System/3 and System/32. A typical Model 10 set costs $170.

The firm can he reached through P.O. Box C, 07070.

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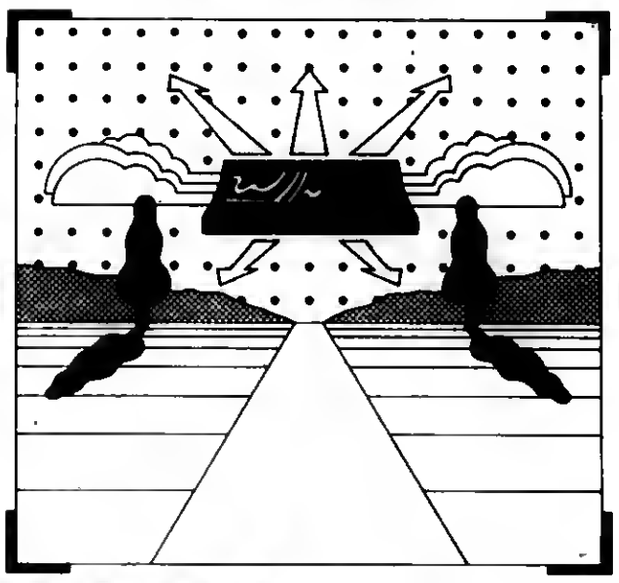
We'd like to show you how you can get the most from your timesharing terminals. Just call us today at 800-631-7050. (In New Jersey, 201-529-1170.) Or write to Western Union Data Services Company, 70 McKee Drive, Mahwah, New New Jersey 07430.

western union data services company

Meet The

The Reasons Behind Datapoint's

ONE

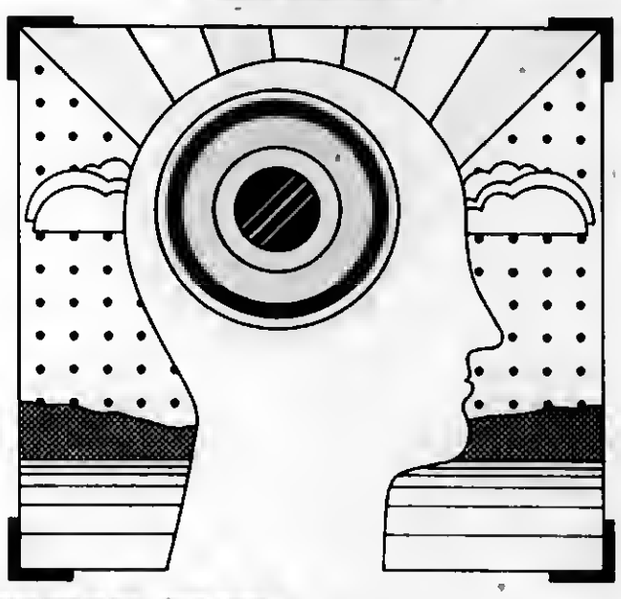


HARDWARE It's no secret; Datapoint Corporation offers the industry's broadest roster of proven dispersed data processing systems, a diversity and selection of equipment with particular appeal for the network system designer. Our full product line includes the Diskette 1100 and Cassette 1100 Intelligent Terminals, the Datapoint 2200 Business Processor and the Datapoint 5500 Advanced Business Processor, all offering powerful internal computers, easy to read video display screens, full typewriter-style keyboards and many other features. Each of these units offer users a sophisticated, integrated data entry, data storage, local data processing and data communications capability.

These versatile, fully programmable processors are backed by a wide array of peripherals expressly designed for business applications. These include: *Three Disk Units;* a low-cost diskette unit, a powerful removable cartridge disk system and, for high volume storage applications, a 24 million character mass storage disk unit. · *Six Printers;* ranging from a 30 cps Servo printer to a 300 LPM Line Printer. Matrix and belt printers are also available. · *Three Tape Units;* both 800 and 1600 bpi drives in 7 or 9 tracks. *Communication Adaptors;* five models are cataloged to cover the communications spectrum from 110 Baud to 4800 Baud, synchronous and asynchronous. IBM compatible, too. *Three Data Terminals;* for network utilization. These well engineered low-cost systems offer easy, reliable operation. Optional terminal printer also available.

Powerful yet easy to use, this equipment places a formidable computing capability in the hands of commercial and business users, allows the effective use of computer power not only by professional EDP personnel in home office facilities but also by relatively untrained workers in field offices. This family of Datapoint equipment (and it's growing all the time) has generated enthusiasm and excitement as well as bottom line profits wherever it's been installed. For users, Datapoint hardware has reduced out of pocket operating costs, eliminated the vexation and extra expense of input error, provided management with a surer control over company operations and allowed efficient computerization of hitherto manually handled work assignments.

TWO



SOFTWARE Fact: a dispersed processor is only as good as its software. That's why Datapoint offers the industry's most extensive library of programming languages, utility and data communications packages, diagnostic routines and associated programs designed for dispersed processing usage.

This software has been created with the intent of making the effective use of Datapoint dispersed equipment as simple and uncomplicated as possible, especially for clerical personnel in field office facilities who may not have a computer background.

Proven Datapoint programming languages include · DATABUS which offers high-level business language features for both data processing and data entry applications. (DATABUS programs written for the 1100 Intelligent Terminal are upward compatible with our multi-user DATASHARE system.) · DATAFORM, a special and again easy to utilize language designed for data entry activities which can be employed by a secretary or clerk without special training. · RPG II, the IBM-standard business language which enables users to take existing RPG II programs and run them virtually unmodified on Datapoint equipment. · BASIC, the well known interactive scientific language, and · DATAPOLL, a data communications language which permits easy error-free automatic data transmission between field work stations and home office facilities. In addition, our DATASHARE multi-programming, multi-terminal system permits a Datapoint dispersed processor to act as a "computer utility" resource for as many as 16 work station terminals for both data entry and data processing tasks.

For maximum efficiency, each Datapoint system operates under sophisticated Operating Systems such as DOS (Disk Operating Systems) and CTOS (Cassette Tape Operating Systems). These Operating Systems offer powerful utilities and easy file management. Files are completely dynamic, and users can add, delete and merge data files using simple commands.

Datapoint software is functional; it's designed for use in basic program creation under demanding professional circumstances and yet can be quickly assimilated and utilized by inexperienced personnel. It's comprehensive; all dispersed user situations are covered by some portion of its capability. Best of all, Datapoint software is available now. We're not talking about software that's "under development"; we're talking about proven, in-use programs. That's a major difference between Datapoint and our competitors.

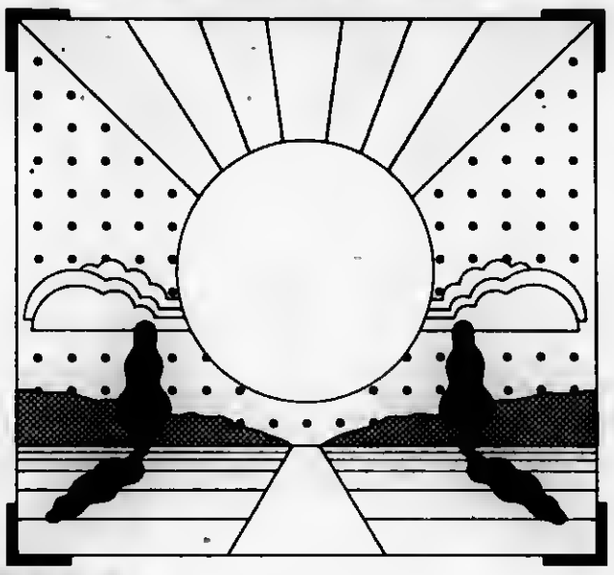
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Big Four

Leadership in Dispersed Data Processing

THREE



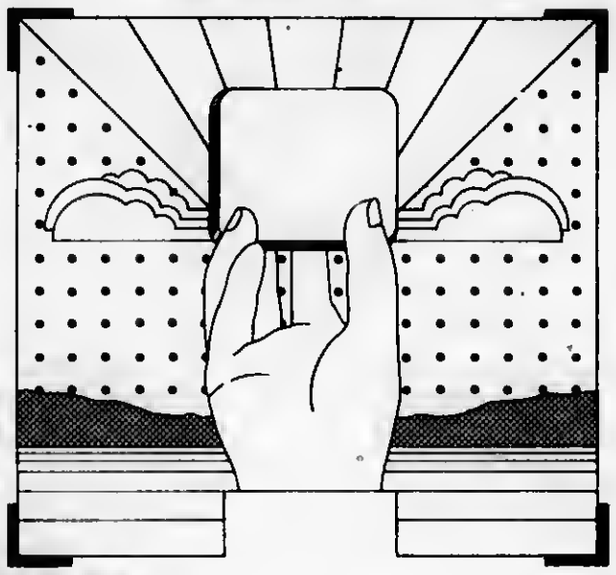
PRICING Unquestionably, Datapoint has led the way in providing a sophisticated computer capability for applications and in field office environments that only a few years ago would have seemed incredible. We've achieved the same sort of breakthrough in the pricing for these products. We've been able to bring sophisticated equipment and software within the economic reach of the dispersed user by taking full and progressive advantage of state of the art advances in solid state technology and by improvements in data communications capabilities. For example, the typewriter-sized Datapoint 5500 Advanced Business Processor with up to 48K user memory based on the new LSI memory technology affords a data processing capacity that only a few years ago would have required a sprawling mainframe computer. These advances not only permit us to offer a superior end product, thanks to our outstanding research and development and engineering groups, but they've also enabled us to deliver a much greater productivity bang-for-the-buck to our customers.

The highly integrated capability represented by Datapoint dispersed processors for data entry, local data processing, local data storage and file management, and data communications offers the business user a powerful work tool at prices as much as an order of magnitude below those charged by competitors for a comparable production capacity. Consider these actual monthly lease rates (two year lease with maintenance) for key items of Datapoint equipment, and bear in mind that in many user situations just a few of these units can handle a company's *total* data processing.

Datapoint 2200 (16K)	$392	Cartridge Disk	$328
Datapoint 5500 (24K)	$667	9-Channel Tape	$273
Diskette 1100 (16K)	$316	Datapoint 3600 Terminal	$ 70
300 LPM Printer	$452	Terminal Printer	$144
120 LPM Printer	$214		

For a DATASHARE configuration which might involve a number of the units indicated above, typical per station lease costs for a 16-station system can work out as low as $260. We encourage you to work out the significance of these economics in your own organization. When it comes to dispersed data processing, no other company can better the price/performance capability offered by Datapoint equipment.

FOUR



SERVICE A sometimes neglected aspect of computer operations is field service. But this concern can't be ignored by designers and operators of dispersed data processing networks who may have equipment scattered literally all over the landscape, often in remote locations. At Datapoint we've taken a dual approach to service — first, we've designed and engineered a product line that combines ruggedness with ease of usage so that the need for service is minimized, and second, we've created a national customer service force that's geared to go anywhere at any time to meet the needs of our customers. In recognition of the extreme importance the service function has for our clients, especially those with facilities in remote locations, we've organized a large and highly professional customer service force, competent in all aspects of maintaining and servicing Datapoint systems and geared to fast, professional response to maintenance problems wherever they may occur. To make it possible for our users to make swift, certain communications with this service force, we've created the Datapoint National Customer Service Center which is staffed on a 24-hour day, 7-day week basis. By dialing a toll free number (national: (800) 531-5770, in Texas: (800) 292-5858) users are guaranteed a response to their needs for a local field service representative within one hour, and usually much sooner. The motto for our Customer Service force is "Good Service is Good Business," and we really mean it.

The Big Four, Hardware, Software, Pricing and Service, constitute the fundamental reasons behind Datapoint's continued leadership in dispersed data processing. The more than 25,000 Datapoint dispersed processing systems now in productive use in field and home offices are tangible evidence of our success at emphasizing these fundamentals. For further information on Datapoint, its capability in dispersed data processing and how it can help your company, write or call the sales office nearest you or contact Datapoint, attention: Marketing Communications, 9725 Datapoint Drive, San Antonio, Texas 78284, (512) 690-7151.

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Mini, 'Beneficial Arson' Aid Forest Fire Research

MACON, Ga. – One way to fight forest fires is with forest fires – controlled fires which remove hazardous natural fuels that build up on the forest floor.

And one way to develop this art of beneficial arson – while also controlling the billowing smoke clouds produced – is to set fire to miniature table-top forests and study the resulting conflagration and smoke, using a high-speed scientifie data collection and a minicomputer to analyze the data.

Forest management researchers at the Southern Forest Fire Laboratory here currently are focusing efforts on determining the fuel and weather conditions for minimum smoke production in "prescription" fires. This entails chemical analysis of the smoke as it travels downwind from the fire.

A specially constructed combustion room houses the table on which the actual miniforest beds are regularly created and then set ablaze. More than 50 sensors monitor the event, scanning at 1 second intervals, feeding data into the system.

The mini system collects, processes and outputs the analysis in real time while simultaneously servicing four other laboratory stations engaged in related forest research.

The high-speed scientific data collection and processing system at this Department of Agriculture's Forest Service Laboratory employs a Hewlett-Packard 9600 computer system with 24K words of core memory, a 2.5M-word disk, analog-to-digital converter and several I/O devices such as tape drives, printer and card reader.

Cubed Combustion

One key experiment conducted by Paul W. Ryan, research forester at the laboratory, involves arranging a table 3-ft by 4-ft in the combustion room (a 30-ft cube-shaped room) with typical forest fuels, such as pine needles, leaves, grasses and organic materials in various stages of decomposition or other understory materials of a timber stand, such as shrubs, vines and seedlings.

The slope of the table is set to represent the conditions under study; air temperature and humidity are preconditioned and fed into the room and the model is ignited.



Ryan uses a syringe to obtain a smoke sample produced from a miniature table-top forest fire at the Southern Forest Fire Laboratory. A Hewlett-Packard 9600 minicomputer is employed to collect and process the scientifie data.

The computerized solid-state system has dramatically speeded the forestry research here, Ryan said. "We used to use an array of strip chart recorders. It took two weeks to reduce the data for each test fire, and we sometimes run several fires a day. We would then punch cards for input to the computer for analysis.

"Now I can review outputs while observing the fire, make adjustments and observe the effects," Ryan said.

Cramer Designs Kits for Micros

NEWTON, Mass. – A ready-to-assemble microcomputer, available initially in three models, has been introduced by Cramer Electronics, Inc.

Termed Cramerkits, the products cost less than $500.

Developed in concert with Microcomputer Technique, Inc. of Reston, Va., the specially designed kits come equipped with either an Intel 8080, a Motorola 6800 or a Texas Instruments TMS 8080 as the central processing unit.

Each kit includes (in addition to all parts except board and power supply) engineering documentation, literature, schematic diagram and programs recorded on a cassette tape.

The components and documentation package are said to enable a designer to design and fabricate a custom microcomputer to suit his specific needs.

Cramer is at 85 Wells Ave., 02159.

Mini Bits

4K Memory Boards Fit PDP-11/45, -50

MAYNARD, Mass. – Digital Equipment Corp. now has a memory matrix board with 4K words of bipolar parity memory for PDP-11/45 and PDP-11/50 computers.

Called the MS11-AP, the solid-state memory unit permits savings of approximately 60% over previously available bipolar memory from DEC for these computers, the company said.

In the matrix board arrangement, up to 32K words of bipolar memory can be installed in a PDP-11/45 or -50.

Bipolar memory permits computer operation at speeds up to 3M instruction/sec, approximately three times as fast as core. Speeds 40% faster than MOS semiconductor memory are standard with bipolar memory, DEC said.

The unit is priced at $19,700 in 16K-word units.

Data Miser Links to PDP-11

SCOTTSDALE, Ariz. – The Data Miser DM06 from International Memory Systems is a 200 track/in. moving-head disk drive available as a plug-compatible replacement for the Digital Equipment Corp. RK05 as a daisy-chain expansion for PDP-11 users who have the RK11/RK05 combination.

The Model DM06 has a capacity of 5M bytes and is plug-compatible with the DEC RK11 and all standard DEC operating systems.

The complete electronic interface is contained on a single 10-in. by 10-in. board.

The unit is priced at $2,950 from the firm at 14609 Scottsdale Road, 85260.

Duplicator/Verifier Added by Fabcit-Addo

GREENWICH, Conn. – The Series 4000-Option 10A duplicator/verifier from Facit-Addo, Inc. is said to be capable of duplicating and verifying a wide range of paper/Mylar tapes from five through eight channels.

The system consosts of a tape processor, two 4020 readers, one 4070 tape punch and tape handling spoolers.

The duplicator/verifier performs two functions. It duplicates punched paper/Mylar tapes and then checks the duplicate by comparing it to the original.

The unit is priced at $10,995 from the firm at 66 Field Point Road, 06830.

APL'ers

We have the only desktop computer that speaks your language... APL and we want to tell you all about it.

Now it's here at last, the world's first low-cost desktop APL full-service computer ... the MCM/70. In addition to a complete APL interpreter, it features a virtual operating system, battery-operated power-fail protection plus a communications subsystem to communicate with other APL computers and terminals.

Essentially compatible with APL.SV, MCM/APL extensions include: executive primitive, dyadic null primitive, advanced function editing, extended primitive formatting, and QUAD system functions and variables. The keyboard layout is IBM 2741 compatible ... plus start and control keys.

If you're truly an APL'er, you'll want to know all about the MCM/70 and how it can become an integral part of the work you're now doing in this powerful, concise language. If you're a true APL'er, you'll be quick to see the advantages the MCM/70 offers in terms of: ■ Personalized computer power right at your own desk ■ Off-line freedom to spend all the time you need on a project without tieing up mainframe equipment. ■ Capability to develop your own files of programs and data with complete security. ■ Cost savings on large system time usage.

You can understand what a breakthrough the low-cost, desktop MCM/70 represents! For the full story send in the coupon today and we'll send you full particulars plus a complimentary MCM/APL pocket language guide.

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Cuts Record Management Costs

System Ups Retailer's Efficiency 20%

NEW YORK – Pinpointing a sales slump before it reaches crisis proportions is one of the primary benefits minicomputers are providing retail supermarkets, according to the president of a 16-store chain here.

"With skyrocketing labor costs and the increase in food prices, record management is becoming one of the few areas where supermarkets can actually minimize costs," said John Catsimatidis, president of Red Apple Supermarkets. "And the minicomputer permits us to have a lot more control over our operation, which will in turn benefit the consumer.

"In fact, the Basic/Four Corp. system we installed a year ago has improved our efficiency by about 20%. For example, we have 525 employees, and it used to take us three days to do the payroll with the old basic accounting methods we were using.

"Now, however, it only takes an hour to do the payroll, once the input is provided."

But where the computer has really proved invaluable is in assessing what happens in each of the 16 stores at a given time and then comparing the data. Each store is broken down into 20 departments. If there is an 8% decrease in sales in one department, the minicomputer lets management zero in immediately on the trouble spot.

Twin Minis Record Stock Transactions

STOCKHOLM, Sweden – Buying and selling at the stock exchange generates a complex amount of fast-moving data which requires sophisticated equipment for efficient distribution. With the twin minis at the Stockholm Stock Exchange, banks and brokers throughout Sweden will be able to receive information on every transaction on the exchange within seconds after the deal has been concluded.

For more than half a century, roll call transactions at the exchange have been handled by numeric terminals used to submit bids. When buyer and seller agree, a bell rings and the deal is flashed on a display board actuated by electromechanical relays.

But this is strictly a bidding system. Until the two Data General Nova 2/10s went into operation, deals had to be recorded manually by clerks using pen and paper. For distribution of the results, brokers in the Stockholm area have been able to subscribe to a special telephone service that enables them to listen to the floor proceedings as they take place. Ticker tapes have never been used in Sweden. Outside of Stockholm a special newscast, broadcast live from a studio in the stock exchange building, gave results.

But with the Nova system, the two record clerks use keyboard terminals for on-line recording of transactions.

When the system is fully operational this fall, any brokerage office in the country will be able to connect a terminal for real-time display of transactions. And at the end of the session, the day's stock list with turnover figures and most-traded-issues information will be sent out to those who have printers installed.

Some of the biggest deals, however, take place during floor trading after the official session ends.

This used to be a noisy affair with much waving of papers and most-traded data being chalked up on a blackboard. With the Nova installation, a display screen has replaced the blackboard, and broker representatives submit their bids quietly from their booths, using terminals.

The system was designed and programmed by AU-System AB, a local software house. In all, about 25 terminals have been installed in the building. The system uses a Nova 2/10 with a second unit for backup, 2M bytes of disk storage, magnetic tape, cassette tape and a large multiplexer.

"These two Novas give us exactly what we need and no more," said Gosta Lindberg, first secretary at the stock exchange. "We spent a couple of years looking into various alternatives and had a number of offers from the large computer firms. Most of them suggested giant systems. We would never have been able to make full use of them. This gradual installation of a minicomputer facility is much cheaper and seems just right for us."

Agency Uses DP To Study Demand For Wool Goods

LONDON – With its share of the world market for textile and carpet goods constantly under assault by synthetic fiber products, the International Wool Secretariat (IWS) has enlisted a mini to assure continued prosperity for thousands of dealers of wool products in more than 40 countries.

Headquartered here with branches in 27 countries, the IWS is a nonprofit organization that builds markets and stimulates demand for wool and wool products around the world.

To assist in worldwide market analysis, promotional efforts and product research, IWS purchased a PDP-15 computer system from Digital Equipment Corp. Using punched cards for data entry and magnetic tapes as the primary storage medium, the system produces scheduling, accounting and statistical reports on a budget limited by the ever-changing fortunes of IWS' sponsoring organizations – wool growers in South Africa and Uruguay, producers and government agencies in Australia and New Zealand.

Two Surveys Yearly

Twice each year a survey is conducted among Woolmark licensees to collect sales and order information. The data is analyzed by computer to pinpoint trends in consumption and demand for quality garments and other goods, broken down into product, geographical area, pricing, etc.

Results of these surveys and returns enable the IWS to select geographical and product areas where the agency should expand or contract its promotional effort in global markets for men's, women's and children's wear, knit wear, carpets and home furnishings. The computer produces a proposed media schedule, showing each IWS branch where advertisements should be placed during the next half-year period.

Model 33ASR with dial-up set and complete maintenance service for $85 per month on 1-year lease. (Slightly higher for 90-day lease.)



RCA open… new line… Teletype*

Now — lease Teletype equipment from RCA for just $45 per month on 1-year lease (send/receive model 33KSR) including maintenance. With dial up set, only 90¢ a day more! (Slightly higher for 90-day lease.)

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- SKOKIE, ILL. 60076, 7820 Gross Point Road, Phone: (312) 965-7850
- DALLAS, TEXAS 75207, 2711 Irving Blvd., Phone (214) ME 1-8770
- MONTEBELLO, CALIF. 90640, 1801 Beach Street, Phone: (213) 885-3069

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RCA



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Dataproducts PortaCom. Easy to take.

Invest in yourself this fall.

Announcing the EDP Seminar Series Fall Schedule

The world of EDP is caught up in a continuous revolution. It's only 24 years since the first business computer made its appearance, and we've gone from tubes, batch processing and single-site giants to multiprogramming, time sharing, data communications, giant minicomputers and hundreds of other technological innovations that were unheard of only recently. Keeping up with this revolution is difficult, to say the least. And that's why we've created the EDP Seminar Series.

The EDP Seminar Series gives you practical applications of the newest advances in computer management. What you learn will save you time and money, because each course is geared to practical dollars and sense application.

Remember, these are seminars, not lectures, and you'll be learning by doing in a shirtsleeve atmosphere. Workshops are an important feature of the Seminars, and round table discussions and shop talk luncheons complement the seminar presentations. The workbooks and course materials are yours to keep, so you'll always have a handy reference to all you've learned.

We've selected leading experts from around the country to guide each of our Seminars. They are highly accomplished specialists in their fields, experienced in presenting their techniques to industry and management. If you're involved in one of the areas shown, you should attend the EDP Seminar Series this fall. What you learn will benefit your company, your installation, and you.

Data Communications Course #1010 – Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

San Diego	**Plaza Int'l Hotel**	**Sept. 29-30**
New York	**St. Moritz**	**Oct. 13-14**
San Francisco	**Dunfey's Royal Coach**	**Oct. 20-21**
Dallas	**Hilton Inn**	**Nov. 10-11**
Miami	**Marriott Miami Beach**	**Nov. 17-18**

Data Communications Course #1020 – Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Miami	**Holiday Inn Airport Lakes**	**Dec. 1-3**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

New York	**Summit Hotel**	**Oct. 22-24**
San Francisco	**Hyatt Regency San Francisco**	**Nov. 12-14**
Chicago	**Hyatt Regency O'Hare**	**Nov. 19-21**

How to Draft Effective Legal Agreements

This one-day seminar is a complete workshop for non-legal, technical people who may be called upon to draft legal agreements for their company. Also led by Roy Freed, this seminar covers a variety of formal agreements, their structure and the legal factors involved. You'll have all the basic skills necessary to write legal agreements, and you'll be able to spot items that really require the attention of lawyers.

Cost for the seminar, including luncheon and a complete workbook on the subject, is $135.

New York	**St. Moritz**	**Oct. 8**
Boston	**Sheraton**	**Oct. 15**

Data Base Design

Given in association with Leo J. Cohen and Performance Development Corporation, this three-day seminar is a package-independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimum File Organization/Indexing Techniques, File Integration, and much more.

Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300.

New York	**St. Moritz**	**Sept. 22-24**
Denver	**Denver Hilton**	**Dec. 1-3**

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

New York	**Summit Hotel**	**Sept. 29-30**
Wash., D.C.	**Marriott at Wash. int'l. Airport**	**Oct. 20-21**
Chicago	**Hyatt Regency O'Hare**	**Oct. 27-28**
San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

New York	**St. Moritz**	**Oct. 6-7**
San Francisco	**Berkeley Marriott**	**Nov. 10-11**

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COMPUTER INDUSTRY

CI Notes

Finalco Arranges Lease Plan

VIENNA, Va. – Finalco, Inc. has arranged $22 million of lease financing for 27 computers operated by the Northwestern Bell Telephone Co.

The lease underwriting covers presently installed Honeywell computers used by Northwestern Bell for its internal DP.

Most of the equipment is being converted from a Honeywell extended lease to seven- and nine-year Finalco leases.

CA Signs $7 Million OEM Deal

IRVINE, Calif. – Computer Automation, Inc. (CA) has received orders for over $7 million worth of Naked Minis from four of its large customers, which President David Methvin views as a sign the OEM business has begun to improve.

General Computer Systems, Inc. submitted a $2.4 million order for minis for use in its key-to-disk systems.

CDC Quits Fare Box Production

WASHINGTON, D.C. – Control Data Corp. said it is stopping production of automatic fare collection equipment for the Washington Metropolitan Area Transit Authority (WMATA) and will lay off about 150 employees.

The contract between CDC and WMATA is the subject of litigation between the parties. The WMATA ordered CDC to cease production, which CDC said was in violation of the court's jurisdiction of the matter.

CDC said it was originally contracted to produce the entire system, but a subsequent WMATA contract for production of part of the system with a third party repudiated the contract with CDC.

Decision Data Operation on Skids

HORSHAM, Pa. – Although Decision Data Computer Corp.'s manufacturing affiliate for the European market has been placed in receivership, the firm said it sees no effect on its European marketing program.

Production here "can and will be increased to meet both domestic and international commitments for the company's products," according to Loren A. Schultz, Decision Data president.

The Department of Commerce of Northern Ireland, which has an 85% equity interest in the unit, International Engineering Ltd., has withdrawn financial support.

Shultz said he does not anticipate any material adverse effect on Decision Data over and above the firm's investment in the affiliate, which is less than $200,000.

Supershorts

3M Co. has licensed Information Terminals Corp. to manufacture 3M's 1/4-in. tape cartridge, to be called the TC2000.

– – –

Entrex, Inc. has donated a Data General Corp. Nova to the Southern Maine Vocational Technical Institute in South Portland, Maine.

– – –

Boeing Computer Services and Cubic Data Systems have agreed to pool their equipment and marketing efforts for DP services in the San Diego area.

– – –

NCR is preparing to announce Cobol for its 8200 system.

Correction

Tymshare, Inc. has reached an agreement in principle for the acquisition of Major Computer Corp., Jericho, N.Y. The Jericho firm has not yet been acquired [CW, Aug. 20].

Worth $210 Million in '76

IBM-GSA Contract Ends Sole Sourcing

WASHINGTON, D.C. – The General Services Administration (GSA) will award IBM a contract worth $210 million but limited to installed equipment only for fiscal year 1976.

Under the contract, no new IBM equipment may be ordered – not even a tape drive – but features that do not upgrade a CPU, such as a floating point, may be rented or purchased, according to Theodore D. Puckorius, commissioner of GSA's Automated Data and Telecommunications Services.

Any new CPUs or peripheral gear must be obtained through competitive bidding.

Federal agencies may continue to rent installed systems, purchase certain rented equipment and obtain software and maintenance at 1975 prices until Jan. 1, Puckorius said.

At that time, government rental and maintenance prices will revert to commercial rates.

In cases where an agency needs IBM equipment for reasons of system compatibility, GSA will award a waiver requiring the agency to invite bids for that IBM hardware from the third-party industry as well as IBM.

In explaining GSA's reasons for limiting IBM's Automated Data Processing (ADP) supply contract, Puckorius said "there has been concern on the part of users and some industry people that IBM was getting favored treatment since we were negotiating with them after the final deadline had passed" [CW, June 18].

IBM failed to meet the Feb. 28 deadline set by GSA for submitting bids for the federal supply schedule.

In view of this, "to allow the company to bid on a full schedule would have been unfair," Puckorius said, "but at the same time, we had to support our present equipment base," estimated to be worth about $1.5 billion.

The government owns 1,060 various IBM systems, valued at $1.128 billion, and rents 303 IBM systems, worth about $419 million, sources estimated.

The final contract decision for 1976 is retroactive to July 1, 1975 and will run until Sept. 30, 1976. This one-time only, 15-month fiscal year was adopted as a means of shifting future fiscal years to an Oct. 1 starting point.

Lessors Get Wedge Into Agencies

By Nancy French
Of the CW Staff

The DP supply contract signed recently by IBM and the General Services Administration (GSA), which contains no price list for new equipment, is seen as a breakthrough for third-party industry members as well as other mainframers seeking government business.

Under the contract, all new systems must be competitively bid on a case-by-case basis; there will be no more waivers for purchasing directly from a supply schedule. Even if an agency needs IBM gear for reasons of compatibility, for example, bids must be let not only to IBM, but also to members of the third-party industry.

After Jan. 1, when the contract calls for the federal price list to revert to commercial rates, third-party lessors will be able to compete on even ground, one lessor said.

At that time, "we will no longer be at the disadvantage of having to pay IBM's higher commercial prices for systems and then leasing them back to the government at rates below IBM's 8% government discount," he said.

Sentiments expressed by third-party dealers were summed up by Charles Barry, Comdisco's vice-president of government sales, who said, "I think it's great the government is finally going to take advantage of the money that can be saved doing business with the third-party industry.

"The only thing GSA could have done better would have been to add a clause requiring all agencies to review present equipment leased from IBM to determine whether they could get a better deal elsewhere," he said.

"By the way," Barry added, "that's already a regulation, but it isn't being enforced."

Jim Benton, executive director of the Computer Lessors Association, agreed, providing "the agencies play it straight and put their bids out on the street. If

(Continued on Page 28)

Firms With One Product Area Most Profitable: IDC

By Molly Upton
Of the CW Staff

WALTHAM, Mass. – The most profitable firms in the independent peripheral manufacturing field in 1974 were either single product area firms selling to original equipment manufacturers (OEM) or communications interconnect firms, according to a report from the International Data Corp. (IDC).

Plug-compatible manufacturing firms fared lowest in averaging profit as a percentage of revenues, placing below a category termed "innovative end-user product firms," the study said.

Profitable firms were generally small with revenues between $8.3 million and $23.1 million, compared with firms with revenues of $23.3 million to $168.7 million, the study found.

Firms with revenues less than $8 million were excluded, as were those related to mainframe manufacturers except for well-established subsidiaries that conduct business separately.

A single product area may be one of the following groups: keyboard equipment, disk/tape drives, memory equipment, printers, interconnect, autotransaction, graphics equipment, remote batch terminals and others, such as paper tape. However, within that group a company may offer a variety of products.

Ranked by descending order of revenues, Mohawk Data Sciences, California Computer Products, Inc., Memorex Corp., Ampex Corp., Dataproducts Corp. and Storage Technology Corp., were revenue leaders in 1974, the report said.

Centronics Data Computer Corp. took top place honors in percentage of profit with 19% from its printers, while Codex Corp. had 16.9% profit from its estimated revenues pertaining to the peripherals in the interconnect area.

Other firms with profits of 8% or more included Applied Digital Data Systems, Inc. (Adds), 16.8%; Information International, Inc., 11.8%; Cogar Corp., 9.6%; Wangco, Inc., 9.3%; Milgo Electronic Corp., 8.5%; and Sycor, Inc., 8%, IDC said.

Taking all 44 firms considered by IDC, the weighted average profit was 3.4% and the median profit about 2.6%.

Categorized by type of equipment, interconnect firms led the profit percentage with 11%, printers were 9.3%; graphics, 6.2%; other, 3.9%; disk/tape, 2.7%; autotransaction, 2.6%; keyboard, 2.2%; and memories, 1.8% during 1974, IDC said.

The single product firms showed 4.9% profits compared with 1.7% for the multiproduct companies, IDC said, while companies with domestic marketing orientation averaged a 4.4% profit compared with those with heavily international marketing efforts, 2.1%.

Firms marketing to OEMs showed profits of 6.4% compared with end-user firms' 3.2%. Those that marketed to both showed a 1.8% profit, IDC figures indicated.

Revenues will nearly triple for the independent peripherals area between 1974 and 1979, jumping from $2.3 billion to $6.4 billion, the report said.

Although the relative rankings of revenues to the product areas will stay about the same, the fastest growing areas will be autotransaction, interconnection and remote batch, all of which will more than triple.

From 1974 to 1979, keyboard revenues will jump from $700 million to $2.125 billion, disk/tape from $550 million to $1.375 billion and memory from $250 million to $500 million, the report said.

Printers should grow from $150 million to $450 million, remote batch from $150 million to $550 million and graphics from $150 million to $300 million; interconnect and autotransaction each will grow from $100 million to $375 million from 1974 to 1979.

The "other" category will double from $150 million to $300 million, the report said.

Breaking the firms into categories such as OEM-only sales, end user sales – both nonkeyboard and keyboard, plug-compatible manufacturers and "unique," IDC found the six firms in the OEM-only group averaged an 11.9% profit percentage of revenues, with all companies profitable in 1974.

The second most profitable group consisted of nine firms that have nonkeyboard products and sell to end users. The average percent of profit was 5.5%. Two of them, Docutel and Lundy, sustained losses in 1974.

A third group, with keyboard products selling to end users, included 10 firms with an average profitability of 3.1%. Sycor was the leader with 8%, followed by Datapoint, 7%; Incoterm, 6.6%; MSI, 5.9%; General Computer, 4%; Entrex, 1.8%; Decision Data, 1.7%; Inforex, .6% and Computer Machinery Corp. and Hazeltine.

In the plug-compatible area, seven of the 13 firms lost money, and none of the firms appeared in the high profitability group.

The average profit was 2.4%, boosted by Storage Technology Corp.'s 7% earnings.

The average profit is overstated, IDC observes, since those firms which lost money were figured at a 0% profit rather than a negative figure. If the magnitude of loss were included, this group would likely have had an average loss, the study remarked.

The group of multiproduct, nonplug-compatible firms was comprised of six firms that averaged 2% profit, an average dragged down by Mohawk's poor performance.

Excluding Mohawk, the group averaged 4.2% profit.

Wescon to Examine 'Next Thousand Days'

SAN FRANCISCO – A view of "Electronics in the Next Thousand Days" will be presented to attendees at the Western Electronic Show and Convention (Wescon) Sept. 16-19 in the San Francisco Civic Auditorium.

Over 32 sessions will focus on topics in the areas of applications, management, marketing and a diverse number of subjects under the category of "survey."

Micros On Stage

Microcomputers will again be a topic of several Wescon sessions, including how to get started in microcomputers, hardware and software support, new developments in design aids, logic analyzers and recorders, applications and use in medical instrumentation.

Communications-oriented sessions will examine "Synchronous Data Link Control – Teleprocessing Tyranny or Plug-Compatible Progress?" It will feature both users and manufacturers, as well as a session on communications satellite systems.

Other technically oriented sessions will focus on instrument interfacing with the Institute of Electrical and Electronics Engineers' (IEEE) standard bus and laser detection and ranging devices.

Attendees can also consider selection of a printer for a minicomputer or microcomputer system, automatic testing in the manufacturing process and electronic identification systems.

In the marketing arena, sessions will look at "Engineering vs. Purchasing: The Limits of Responsibility" and "Fielding a Winning Sales Team."

Sessions in the management area will include discussions on employment, stock ownership, plans for a high technology company and "Recipes for Success in the International Business Cookbook."

There will also be a session on "Promoting Women? What's the Problem?"

The sessions will convene at 10 a.m. and 1:30 p.m. beginning Tuesday morning and ending Friday morning.

Brooks Hall, location of the exhibits, is open 9:30 a.m. to 5 p.m. Tuesday through Thursday and 9:30 a.m. to 4 p.m. Friday.

In addition to the 32 sessions, there will be two special-fee seminars at the Towne-house Hotel Sept. 17 and 18 on "Converting Your Ideas Into a Profitable Business" and "How to Start and Finance a New Business," respectively. The fee for each day-long seminar is $50.

At a luncheon Tuesday, Daniel A. McMillan III, publisher of *Electronics*, will deliver the keynote address, giving an overview of electronics and the marketplace in the next thousand days.

On Thursday, the 21st annual Distributor-Manufacturer-Representative Conference will be held at the St. Francis Hotel, providing a conference within a conference.

The registration fee for Wescon is $5. It is sponsored by the San Francisco Bay Area Council and Los Angeles Council of the IEEE and the Northern and Southern California Chapters of the Electronic Representatives Association.

Further information can be obtained from Wescon at 3600 Wilshire Blvd., Los Angeles, Calif. 90010.

Interdata Expands Terminal Group

OCEANPORT, N.J. – Interdata, Inc. has expanded its Terminal Products Group into a business unit as a result of the acceptance of its Carousel product line, according to Daniel Sinnott, Interdata president.

James R. Folts, formerly director of product marketing, has been named general manager of the unit.

Folts said he expects monthly production of the 30 char./sec Carousel printer units to reach several hundred in 1976 and employment at the Randolph, N.J., plant to reach 100.

"We expect the terminal market to grow at a 50% annual rate," Folts said.

"Creating this separate business unit reflects our plan to serve that market aggressively. The Carousel is the first in a planned comprehensive family of terminal-oriented devices," he added.

Modcomp Gets Second Nasa Pact, Restructures Operations Group

FORT LAUDERDALE, Fla. – Modular Computer Systems, Inc. (Modcomp) has received its second large contract in recent months from the National Aeronautical and Space Administration (Nasa), reorganized its operations group to better handle large network orders and laid off about 40 people in "redundant jobs."

The newest pact with Nasa calls for 73 Modcomp II/25 systems, valued at over $4 million, over a 21-month period. The systems will join other Modcomp systems at Nasa's Jet Propulsion Laboratory performing data handling and processing functions for the deep space network.

Modcomp was selected recently to provide systems for the Launch Processor System for the upcoming Space Shuttle program.

The restructuring creates divisions in manufacturing and systems. Each area is a separate cost center reporting to Robert G. DiStefano, who was named vice-president of operations.

The move was in response to an increased demand for large networks of systems, according to Kenneth G. Harple, Modcomp president.

"Under the new organization, Modcomp will be better able to meet the demand for large, complex network and systems configurations without impacting the small systems business which has been primarily responsible for the company's spectacular growth during the past five years," he said.

The Manufacturing Division supplies standard products to end users and to the Systems Division, which is responsible for all systems engineering and special software as well as quality control.

The consolidation of about 40 jobs is an effort to maintain a profit level in the third quarter, a spokesman said.

Lessors See More Agency Orders

(Continued from Page 27)

so, we're going to get some of that business."

Benton added, however, that "as an industry, we'll have to wait and see before really making a judgment. Oftentimes what GSA says and what the agencies actually do are way out of synchronization."

No Sole Sourcing

David Pappert, Itel's vice-president and regional manager for federal marketing, said "we're delighted with this contract.

"For the first time, agencies won't have the alternative of sole sourcing entire computer systems off the federal supply schedule. We're also delighted that IBM's 8% discount, which worked to the third parties' disadvantage, will now be eliminated," he added.

Terry Miller, president of Government Sales Consultants, Inc., a firm that offers consulting services and seminars on DP procurement, praised GSA for not bending to agency pressure to let IBM submit a contract for new equipment after the deadline.

"GSA did a good job negotiating," Miller said, "certainly as well as anyone could have expected for the spot it was in."

"It had a huge base of IBM equipment to protect, but it certainly wouldn't have been fair to the other vendors not to penalize IBM for failing to get their bid in on time," he said.

GSA Wins

Miller pointed out that, when push comes to shove, GSA can and has imposed its will over IBM.

One example Miller cited was the fixed-price option clause issue back in 1967-68. At that time, GSA wrote a regulation requiring vendors to estimate and contract for five- and six-year systems lives and provide maintenance at a fixed price over that period of time, he explained.

After initially objecting to the terms, IBM complied.

'Egg on Its Face'

Benton, on the other hand, thinks GSA came out of this "with a little egg on its face." As he sees it, "GSA looked pretty silly when it backed down on its original deadline on the contract and had to continue to negotiate past the deadline.

"IBM, in effect, told GSA, 'We'll close you down. Send back your gear.' IBM is so powerful it could just about do that if it wanted to," he said.

While IBM has only 20% to 25% of the government's machines at the moment, those 370s "are going in by the truck load, and IBM had GSA in a very difficult position," Benton added.

Regardless of who actually signs agency system contracts, all agreed it would be IBM that wins the business in the end because third-party lessors have to buy the large 370 systems from IBM anyway. "So IBM gets cash out front, which will surely increase its earnings this year," Benton said.

Contract 'No Bargain'

As for the contract itself, Miller observed "it's really no bargain. After Jan. 1, the government will be paying regular commercial prices for all its leased systems as well as for maintenance.

"If individual agencies go to third-party maintenance and leasing firms where the equipment is available, they will get better deals.

"Unfortunately, that won't be possible in the case of 370/168s because nobody's selling them but IBM," he said.

IBM did give the government a 1% discount in the form of a $2.2 million special purchase option credit fund to use against the purchase price of machines agencies may wish to convert from rental to purchase, according to Miller, but IBM has included similar credit option funds in its annual federal supply contract in the past.

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Burroughs Gives Demonstration Of Pepe System

PAOLI, Penn. – Major portions of the Burroughs' Parallel Element Processing Ensemble (Pepe) system were recently demonstrated here to members of the U.S. Ballistic Missile Defense Advanced Technology Center and other government representatives.

The hardware portion of the Pepe system, being developed by Burroughs Federal and Special Systems Group under subcontract to System Development Corp., is valued at over $6 million.

The system architecture includes three control units generating instructions for multiple processing elements which operate in parallel to achieve high-speed computations required for ballistic missile defense applications, according to Burroughs.

Delivery and installation of the complete Pepe system is scheduled for 1976.

Orders & Installations

The Department of Chemistry at Revelle College at the University of California has ordered a V72 from Varian Data Machines. The system will control a centralized disk storage facility sharable by a network of laboratory minicomputers.

Ramco International, Inc. has installed a "Real-Time" conversational program from Grumman Data Systems Corp. to be used for inventory control of commercial airline parts and equipment.

Acts Computing has ordered Peripherals General, Inc.'s Honeywell/GE-compatible Disc Storage Systems to replace its current Honeywell equipment.

Ferry Morse, Inc. has ordered a Univac 90/30 to handle inventory control, forecasting, order entry, accounting and billing at the seed distributor's headquarters.

R.T. French has purchased rights to use the Adaptable Data Base System (Adabas) from Software AG.

Five university members of the Mid-Illinois Computer Cooperative will use a Control Data Corp. Cyber 70 Model 72 computer system installed at Southern Illinois University in Edwardsville.

American Express, Inc. has ordered 300 additional Addressograph Multigraph Co, uter Access Terminal Systems (Amcat). When installed, American Express' "Centurion" network will have 1,300 terminals.

Global Associates, a logistics support service group for U.S. government agencies, has installed a Univac 90/30.

Richmond College in Staten Island, N.Y. has installed a Burroughs B1726 system to be used for administrative operations in addition to student records and registration.

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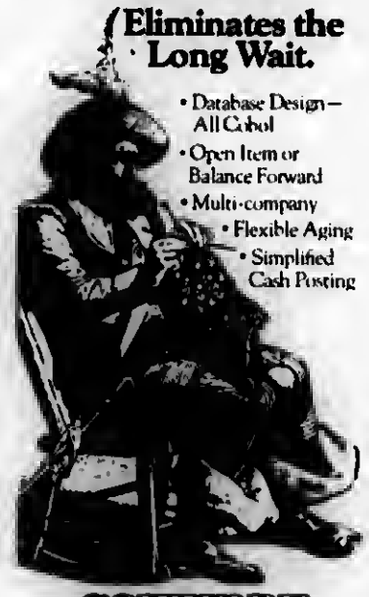
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...Toward the Bottom Line

Mohawk Data Sciences has reached an agreement in principle with a group of banks for a revolving credit agreement that could reach up to $102.5 million. Under the agreement, which would replace one expiring Oct. 31, the banks would make available a multicurrency borrowing up to $102.5 million initially, declining to $83 million at the end of May 1977.

$$$

Decision Data Computer has arranged a $28 million long-term debt financing program with five banks. Proceeds will finance a domestic leasing subsidiary, retire short-term bank debt and general corporate purposes.

$$$

Nashua decreased its debt in the first half of the year by $5.6 million for accounts receivables and $19.6 million for inventory.

$$$

Growth projections at Hewlett-Packard (HP) call for employment to nearly double by 1980, barring unforeseen difficulties, said John Doyle, corporate development director. Minority employment at HP has grown from 11% to 16% in the past five years, said Ray Wilbur, vice-president of personnel.

$$$

Dividend time . . . Automatic Data Processing raised the annual rate of its dividends to 40 cents a share from 20 cents a share and will pay 10 cents on a quarterly basis on Oct. 1 to shareholders of record Sept. 5.

Net Income for Nine Months Rises 8% at HP

PALO ALTO, Calif. – Hewlett-Packard Co.'s third-quarter earnings were off nearly 12% compared with year-ago figures, but earnings rose 8% in the nine months.

The rate of international orders outpaced domestic orders, rising 18% on the nine months compared with 1.5% for domestic.

"Increasing pressure on profit margins, particularly in pocket-sized calculators, plus order and shipment rates lower than we had anticipated in several other product categories, resulted in the decline in earnings for the period," President William R. Hewlett said.

Revenues for the third quarter ended July 31 totaled $245.9 million, compared with $233.6 million for the year-ago period.

Earnings fell to $20.3 million or 73 cents a share from nearly $23 million or 84 cents a share during the 1974 third quarter.

Revenues for the nine months amounted to $706.3 million, a 10.5% increase over $639.2 million in the year-ago period.

Earnings rose 8% to $62.7 million or $2.27 a share. This compares with earnings of nearly $58 million or $2.14 a share during the first nine months of last year.

Incoming orders for the quarter rose 6.1% to $261.9 million compared with $246.8 million booked in the corresponding period of 1974.

For the nine-month period, orders totaled $753.2 million, up 9.2% from a year ago when orders were $689.8 million.

Pertec Reports Record '75 Profits

EL SEGUNDO, Calif. – Pertec Corp. stemmed the tide of decreasing earnings with record revenues and profits for the year ended June 27. Revenues were up 46% while earnings rose 120% over those of last year, and the fourth quarter set records.

For the year, revenues rose to $48 million compared with $32.9 million last year.

Earnings totaled $2.8 million or 90 cents a share compared with $1.3 million or 41 cents a share in 1974, when there was a $1 million charge from discontinued printer operations.

During the fourth quarter, revenues reached $13.5 million compared with $9.5 million in the year-ago period, while earnings rose to $956,000 or 31 cents a share compared with $880,000 or 29 cents a share.

The 1974 results include $1.2 million from the sale of the firm's computer-output microfilm operation.

"This year's achievement marks a significant turnaround after three years of progressively declining profits," said President Ryal R. Poppa.

"Our Business Systems Division, which was unprofitable last year, recorded dramatic increases in both revenues and profits. Our Peripheral Equipment Division experienced a modest growth rate of 12% which was well below their anticipated revenues, yet was able to achieve almost 100% of their profit expectations," he said.

Sales Surpass Projections at MAI

NEW YORK – Management Assistance, Inc. (MAI) scored record earnings and revenues for the third quarter and nine months with revenues ahead of the projected 15% to 20% growth rate.

Sales of Basic/Four systems in nine months grew 47% over a year ago to over $30 million. Backlog for the Basic/Four exceeded $14 million, compared with $11 million at the start of the fiscal year.

Earnings for the third quarter, ended June 20, were $1.9 million or 7 cents per share compared with $1.2 million or 4 cents per share for the same period last year.

Revenues for the quarter totaled $24.3 million, 21% over the $20 million for last year's third quarter.

Tax credits in the 1975 and 1974 periods amounted to $818,000 and $652,000, respectively.

In the nine months, MAI earned $4.1 million or 14 cents a share compared with $1.7 million or 6 cents per share last year.

The nine-month period of 1975 reflects a credit of $928,000 after deducting a $592,000 write-off of a receivables from Potter Instrument Co., while in 1974 there was a $1.1 million tax credit.

Revenues rose 23% in the nine months to $69.1 million compared with $55.9 million for the same period last year.

Raymond P. Kurshan, chairman and president, said "Both earnings and revenues for the 1975 third quarter exceeded those of the first and second quarters."

"The improvements came from our domestic and foreign activities in sales of Basic/Four systems and in DP equipment service and maintenance," he said.

"MAI's achievements to date confirm our earlier projections that both revenues and net income will continue to rise and our overall performance for the year will set an all-time record," said Kurshan.

REI Improves Nine-Month Earnings Despite Special Credit Last Year

DALLAS – Despite a $2 million special credit last year, Recognition Equipment, Inc. (REI) managed to better earnings during the nine months, when earnings reached $2.1 million or 36 cents a share compared with $1.4 million or 26 cents a share in the year-ago period.

Revenues for the nine months rose to $42.5 million compared with $28.6 million last year. The $42.5 million includes $6.9 million, the value of a Trace system contract installed at First National City Bank. The company said it has essentially no profit impact from these revenues.

However, during the third quarter, although REI's operating income rose to $509,000 compared with a loss of $167,000 in the year-ago period, earnings were less than a year ago.

Earned $733,000

The firm earned $733,000 or 12 cents a share, including a $224,000 tax credit, compared with $2.1 million or 40 cents a share in the year-ago period, when there was the $2 million gain on restructuring convertible subordinated notes and $252,000 in tax credits.

Revenues for the three months rose to $13.5 million compared with $9.5 million in the year-ago period.

As of July 31, the backlog of firm orders totaled $41.5 million, including $858,000 for optical character recognition wands on an if-sold basis, up from $22.4 million last year.

Expansions

Honeywell will establish a facility to package integrated circuits located at the Las American Industrial Park in Chihuahua, Mexico.

Burroughs Corp. has purchased an 110,000 sq ft plant for the manufacture and engineering of its Series S document-handling systems in Wayne Township, Mich. The plant will provide the space needed for expansion of the Series S program and will provide additional space at the Plymouth plant for expansion of the Series L and Series TC programs.

Dataproducts Corp. has opened a 35,000 sq ft addition to assemble and manufacture printers for the European market in Dublin, Ireland.

Control Data Corp. has begun construction on its first European Cybernet computer center which will house two CDC Cyber 70 Model 73s and two IBM 370/158s. It will be located in Brussels, Belgium.

Versatec has moved to larger facilities in Santa Clara at the intersection of Kifer Road and Bowers Ave. The $4 million building of over 100,000 sq ft will house up to 500 employees.

Tymshare, Inc. has moved into larger headquarter facilities at 20705 Valley Green Drive, Cupertino, Calif. 95014.

Entrex, Inc. has leased space at 10010 Santa Monica Blvd. in Los Angeles for a sales and training office.

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Earnings Reports

COMPUTER SCIENCES
Three Months Ended June 27

	1975	1974
Shr Ernd	$.11	$.04
Revenue	50,367,000	39,733,000
Earnings	1,524,000	585,000

INTEL
Three Months Ended June 30

	1975	1974
Shr Ernd	$.52	$1.00
Revenue	31,501,000	36,223,000
Earnings	3,613,000	6,701,000
6 Mo Shr	1.06	1.99
Revenue	61,868,000	68,709,000
Earnings	7,305,000	13,304,000

COMPUTER INVESTORS GROUP
Year Ended March 31

	1975	1974
Revenue	$28,882,000	$23,231,000
Spec Cred	306,000	.....
Loss	4,230,000	1,812,000

WAVETEK
Three Months Ended July 5

	1975	1974
Shr Ernd	$.14	$.13
Revenue	2,434,300	2,366,700
Earnings	119,700	108,000
9 Mo Shr	.29	.53
Revenue	7,398,100	7,692,000
Earnings	247,600	454,300

DATA CARD
Three Months Ended June 28

	a1975	b1974
Shr Ernd	$.17	$.17
Revenue	3,184,000	1,929,000
Earnings	263,000	251,000

a-Includes operations of Troy division acquired in May. b-Restated to reflect accounting changes.

DATA DISC
Three Months Ended July 4

	1975	1974
Shr Ernd	$.03	$.02
Revenue	1,812,000	2,564,000
Earnings	30,000	20,000
6 Mo Shr	.....	.19
Revenue	3,499,000	4,949,000
Earnings	(66,000)	195,000

LITRONIX
Three Months Ended June 29

	1975	1974
Shr Ernd	$.10	.....
Revenue	13,332,000	$8,698,000
Earnings	252,000	(35,000)
6 Mo Shr	.17	.02
Revenue	23,663,000	15,446,000
Earnings	433,000	41,000

MACRODATA
Three Months Ended June 30

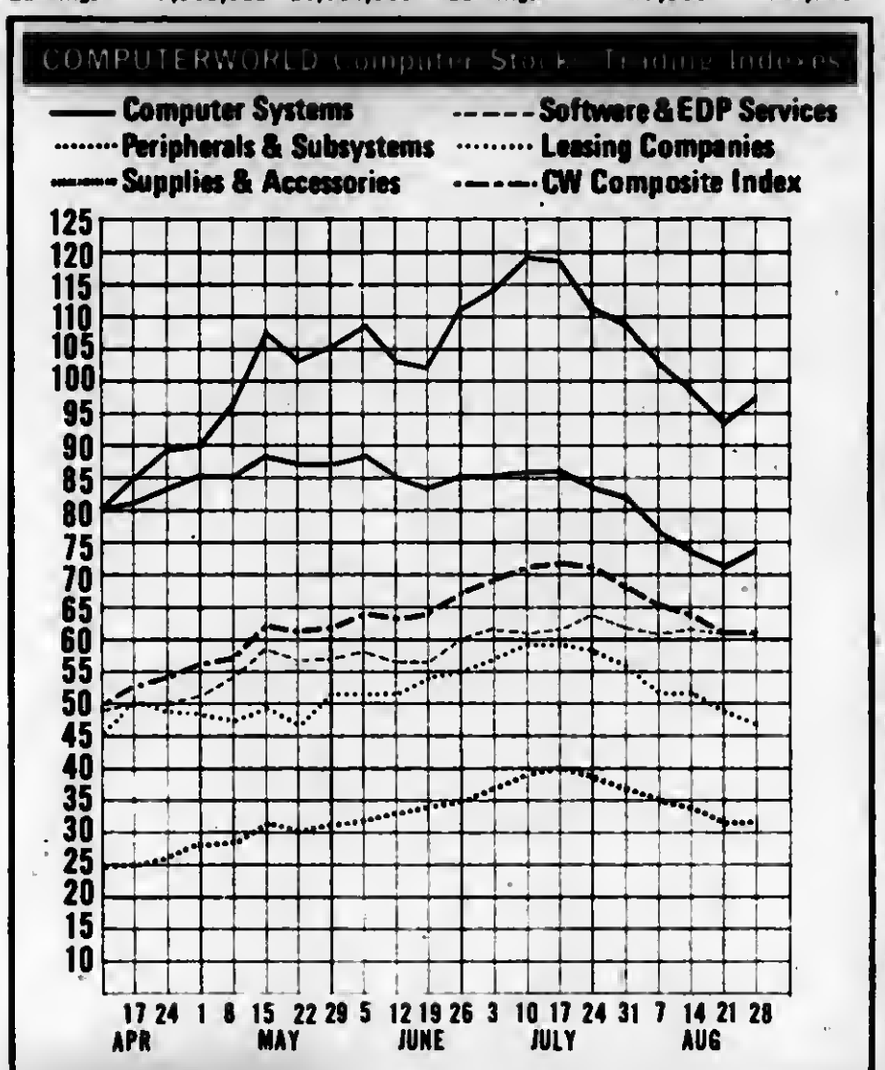
	1975	1974
Shr Ernd	.....	$.24
Revenue	$2,877,471	3,258,257
Earnings	(56,837)	238,530
6 Mo Shr	.11	.46
Revenue	5,885,980	6,258,333
Earnings	117,887	416,919

TALLY
Three Months Ended June 29

	1975	1974
Shr Ernd	$.09	$.06
Revenue	5,439,000	4,300,000
Tax Cred	20,000	41,000
Earnings	205,000	162,000
6 Mo Shr	.10	.11
Revenue	9,871,000	8,454,000
Tax Cred	55,000	73,000
Earnings	233,000	287,000

MODULAR COMPUTER SYSTEMS
Three Months Ended June 30

	1975	1974
Shr Ernd	$.20	$.18
Revenue	9,034,000	6,056,000
Earnings	594,000	485,000
6 Mo Shr	.38	.32
Revenue	17,706,000	11,012,000
Tax Cred	.....	188,000
Earnings	1,141,000	1,076,000



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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 27, 1975

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE [1]	CLOSE AUG 27 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	88 5/8	+1 1/4	+1.4
O	COMPUTER AUTOMATION	2- 10	8	+ 1/2	+6.6
N	CONTROL DATA CORP	11- 23	16 1/4	+1	+6.5
N	DATA GENERAL CORP	10- 39	27 1/4	+1 5/8	+6.3
O	DATAPOINT CORP	6- 26	17 3/4	+1 1/4	+7.5
O	DIGITAL COMP CONTROL	1- 4	3 1/4	0	0.0
N	DIGITAL EQUIPMENT	46-122	110 5/8	+4 1/8	+3.8
N	ELECTRONIC ASSOC.	2- 3	2 3/8	+ 1/8	+5.5
A	ELECTRONIC ENGINEER.	5- 13	8 5/8	+ 3/8	+4.5
N	FOXBORO	23- 42	30 3/4	+ 3/4	+2.5
O	GENERAL AUTOMATION	6- 14	6 7/8	-1 1/4	-15.3
O	GRI COMPUTER CORP	1- 1	5/8	+ 1/8	+25.0
N	HEWLETT-PACKARD CO	58-120	92 1/2	-6 5/8	-6.6
N	HONEYWELL INC	22- 40	28 1/8	+1 1/4	+4.6
N	IBM	158-224	181	+4 1/2	+2.5
O	MEMOREX	1- 10	7	- 5/8	-5.1
O	MICRODATA CORP	2- 6	4 5/8	+ 1/8	+2.7
O	MODULAR COMPUTER SYS	5- 19	10 1/2	-1 1/2	-12.5
N	NCR	15- 39	26 7/8	+1 1/2	+5.9
O	PRIME COMPUTER INC	2- 6	5	0	0.0
N	PERKIN-ELMER	16- 30	23 1/2	+1 3/8	+6.2
N	RAYTHEON CO	26- 59	49 3/4	+2 1/8	+4.4
N	SINGER COMPANY	10- 17	12 1/4	+ 7/8	+7.6
N	SPERRY RAND	26- 49	40 1/4	+ 1/2	+1.2
A	SYSTEMS ENG. LABS	1- 5	3 1/8	0	0.0
O	ULTIMACC SYSTEMS INC	1- 6	5 5/8	0	0.0
N	VARIAN ASSOCIATES	7- 19	13 3/8	+ 7/8	+7.0
N	WANG LABS.	7- 17	11 3/4	+ 1/4	+2.1
N	XEROX CORP	51- 86	58	+5	+9.4
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	3 3/8	0	0.0
A	COMMERCE GROUP CORP	2- 4	3	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	3/4	0	0.0
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	OCL INC	1- 1	1/2	0	0.0
N	PPF INC	3- 6	4 1/2	- 1/8	-2.7
O	EQP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	3 1/2	+ 1/4	+7.6
A	GREYHOUND COMPUTER	2- 3	2 7/8	0	0.0
A	ITEL	3- 9	5 7/8	+ 1/8	+2.1
N	LEASCO CORP	4- 8	6	- 1/8	-2.0
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	1- 4	2 3/8	- 3/8	-13.6
A	PIONEER TEX CORP	2- 7	5	- 1/4	-4.7
A	ROCKWOOD COMPUTER	1- 1	1/4	- 3/8	-60.0
N	U.S. LEASING	8- 14	8 7/8	+ 5/8	+7.5

EXCH		1975 RANGE [1]	CLOSE AUG 27 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	1	0	0.0
A	APPLIED DATA RES.	1- 13	1 3/4	0	0.0
N	AUTOMATIC DATA PROC	29- 65	51 5/8	+1 5/8	+3.2
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
O	CENTRAL DATA SYSTEMS	3- 7	6 1/2	0	0.0
O	COMPUTER DIMENSIONS	2- 6	4	- 1/4	-5.8
O	COMP ELECTION SYSTMS	3- 6	5 1/4	0	0.0
O	COMPUTER HORIZONS	1- 1	3/4	- 1/8	-14.2
O	COMPUTER NETWORK	1- 3	2 3/8	0	0.0
N	COMPUTER SCIENCES	2- 6	4 1/2	+ 3/8	+9.0
O	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
O	COMPUTER USAGE	2- 4	2 3/8	+ 1/8	+5.5
O	CONSHARE	3- 4	2 3/4	- 1/8	-4.3
O	DATATAB	1- 2	1 3/4	0	0.0
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	18 1/4	+ 7/8	+5.0
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	3/4	0	0.0
O	KEANE ASSOCIATES	2- 3	2 1/4	0	0.0
O	KEYDATA CORP	2- 3	2 1/2	- 1/8	-4.7
O	LOGICON	3- 5	3 5/8	0	0.0
A	MANAGEMENT DATA	1- 3	1 3/4	- 3/8	-17.6
O	NATIONAL CSS INC	6- 14	12	+1 3/4	+17.0
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	13 1/4	+ 1/2	+3.9
N	PLANNING RESEARCH	2- 6	3 7/8	0	0.0
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	3 5/8	+ 1/8	+3.5
O	REYNOLDS & REYNOLD	10- 24	11	-1	-8.3
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	3/4	0	0.0
O	TYMSHARE INC	7- 21	16 3/8	+1 3/8	+9.1
A	URS SYSTEMS	2- 4	3	- 1/2	-14.2
N	WYLY CORP	2- 4	3	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	6 1/2	+ 7/8	+15.5
O	ADVANCED MEMORY SYS	1- 7	4	+ 5/8	+18.5
N	AMPEX CORP	3- 7	5 1/8	+ 3/8	+7.8
O	ANDERSON JACOBSON	1- 3	1 7/8	- 1/2	-21.0
O	BEEHIVE MEDICAL ELEC	1- 5	3	- 1/8	-4.0
A	BOLT,BERANEK & NEW	5- 13	10	+ 7/8	+9.5
N	BUNKER-RAMO	4- 8	4 5/8	0	0.0
A	CALCOMP	4- 7	4	- 1/4	-5.8
O	CAMBRIDGE MEMORIES	3- 5	3 3/4	- 1/8	-3.2
N	CENTRONICS DATA COMP	7- 25	15 1/4	- 3/4	-4.6
O	CODEX CORP	15- 38	29 1/4	+2 3/4	+10.3
O	COGNITRONICS	1- 2	1 1/8	0	0.0
O	COMPUTER COMMUN.	1- 2	1	0	0.0
O	COMPUTER CONSOLES	3- 7	4 1/4	-1 1/4	-22.7
A	COMPUTER EQUIPMENT	1- 2	1 3/4	+ 1/4	+16.6
O	COMPUTER MACHINERY	1- 2	1 3/4	+ 1/8	+7.6
O	COMPUTER TRANSCEIVER	1- 2	1 1/8	0	0.0
O	CONTEN	2- 5	3 1/2	- 1/4	-6.6

EXCH		1975 RANGE [1]	CLOSE AUG 27 1975	WEEK NET CHNGE	WEEK PCT CHNGE
N	CONRAC CORP	12- 23	15 1/8	-1 3/4	-10.3
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	5- 16	9 3/8	+ 1/4	+2.7
A	DATA PRODUCTS CORP	2- 6	3 5/8	+ 1/8	+3.5
O	DATA TECHNOLOGY	1- 3	1 3/4	0	0.0
O	DATUM INC	1- 2	1 3/8	- 1/8	-8.3
O	DECISION DATA COMPUT	4- 7	4 3/4	+ 1/2	+11.7
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DIXAN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & N	1- 3	1 3/4	+ 1/8	+7.6
O	FABRI-TEK	1- 1	1	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1 1/4	0	0.0
N	HAZELTINE CORP	3- 6	4	- 1/4	-5.8
N	HARRIS CORP	18- 29	23	+1	+4.5
A	INCOTERM CORP	3- 12	9 1/8	- 1/4	-2.6
O	INFOREX INC	2- 5	2 7/8	0	0.0
O	INFORMATION INTL INC	9- 14	11 3/4	- 3/8	-3.0
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	5/8	0	0.0
A	MILGO ELECTRONICS	9- 24	15 5/8	+ 1/8	+0.8
N	MOHAWK DATA SCI	1- 5	2 7/8	+ 3/8	+15.0
O	OPTICAL SCANNING	1- 3	3	0	0.0
O	PENRIL CORP	2- 2	1 1/2	- 1/8	-7.6
O	PERTEC CORP	2- 8	4 3/4	-1	-17.3
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	3/4	0	0.0
O	QUANTOR CORP	2- 6	4 5/8	+ 1/8	+2.7
O	RECOGNITION EQUIP	2- 9	6 1/8	+ 1/8	+2.0
N	SANDERS ASSOCIATES	3- 11	6 7/8	+ 3/4	+12.7
O	SCAN DATA	1- 3	1 3/4	- 1/8	-6.6
O	STORAGE TECHNOLOGY	6- 17	12 1/4	+1	+8.8
O	SYCOR INC	5- 15	13 3/4	+1 1/2	+12.2
O	T BAR INC	3- 6	5 3/8	+ 1/8	+2.3
O	TALLY CORP.	1- 5	3 1/8	0	0.0
O	TEC INC	1- 4	3	0	0.0
N	TEKTRONIX INC	15- 41	32	-1 1/4	-3.7
N	TELEX	1- 3	2 1/8	- 1/8	-5.5
O	WANGCO INC	4- 9	5 7/8	+ 1/8	+2.1
O	WILTEX INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
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A	BARRY WRIGHT	5- 7	6 1/4	- 1/4	-3.8
O	CYBERNATICS INC	1- 1	1/2	0	0.0
A	DATA DOCUMENTS	29- 42	34	+2 1/8	+6.6
O	DUPLEX PRODUCTS INC	12- 25	16	+1 1/8	+7.5
N	ENNIS BUS. FORMS	5- 7	5 1/8	- 1/8	-2.3
O	GRAHAM MAGNETICS	5- 13	8 1/4	+1	+13.7
O	GRAPHIC CONTROLS	8- 21	11 1/2	+1	+9.5
N	3M COMPANY	63- 88	83 3/4	+2 1/4	+4.3
O	MOORE CORP LTD	39- 51	43 3/4	+1 1/2	+3.5
N	NASHUA CORP	11- 22	12 1/4	+ 5/8	+5.3
O	STANDARD REGISTER	11- 20	15 3/4	+ 1/4	+1.6
O	TAB PRODUCTS CO	4- 8	5 3/4	0	0.0
N	UARCO	17- 24	19 3/4	- 1/4	-1.2
O	VANIER GRAPHICS CORP	4- 7	4 3/4	0	0.0
A	WABASH MAGNETICS	3- 5	4	+ 1/8	+3.2
N	WALLACE BUS FORMS	15- 25	18 1/8	- 1/4	-1.3

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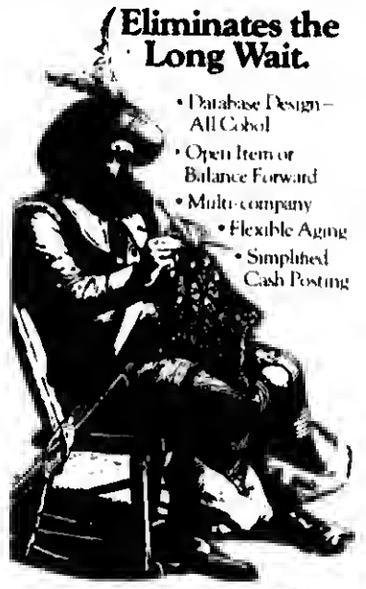
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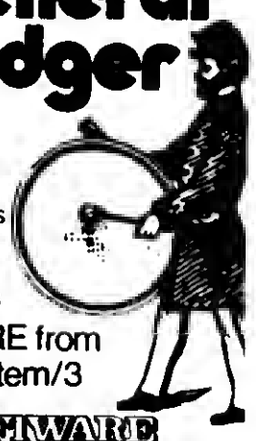
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...Toward the Bottom Line

Mohawk Data Sciences has reached an agreement in principle with a group of banks for a revolving credit agreement that could reach up to $102.5 million. Under the agreement, which would replace one expiring Oct. 31, the banks would make available a multicurrency borrowing up to $102.5 million initially, declining to $83 million at the end of May 1977.

$$$

Decision Data Computer has arranged a $28 million long-term debt financing program with five banks. Proceeds will finance a domestic leasing subsidiary, retire short-term bank debt and general corporate purposes.

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Nashua decreased its debt in the first half of the year by $5.6 million for accounts receivables and $19.6 million for inventory.

$$$

Growth projections at **Hewlett-Packard (HP)** call for employment to nearly double by 1980, barring unforeseen difficulties, said John Doyle, corporate development director. Minority employment at HP has grown from 11% to 16% in the past five years, said Ray Wilbur, vice-president of personnel.

$$$

Dividend time . . . **Automatic Data Processing** raised the annual rate of its dividends to 40 cents a share from 20 cents a share and will pay 10 cents on a quarterly basis on Oct. 1 to shareholders of record Sept. 5.

Net Income for Nine Months Rises 8% at HP

PALO ALTO, Calif. – Hewlett-Packard Co.'s third-quarter earnings were off nearly 12% compared with year-ago figures, but earnings rose 8% in the nine months.

The rate of international orders outpaced domestic orders, rising 18% on the nine months compared with 1.5% for domestic.

"Increasing pressure on profit margins, particularly in pocket-sized calculators, plus order and shipment rates lower than we had anticipated in several other product categories, resulted in the decline in earnings for the period," President William R. Hewlett said.

Revenues for the third quarter ended July 31 totaled $245.9 million, compared with $233.6 million for the year-ago period.

Earnings fell to $20.3 million or 73 cents a share from nearly $23 million or 84 cents a share during the 1974 third quarter.

Revenues for the nine months amounted to $706.3 million, a 10.5% increase over $639.2 million in the year-ago period.

Earnings rose 8% to $62.7 million or $2.27 a share. This compares with earnings of nearly $58 million or $2.14 a share during the first nine months of last year.

Incoming orders for the quarter rose 6.1% to $261.9 million compared with $246.8 million booked in the corresponding period of 1974.

For the nine-month period, orders totaled $753.2 million, up 9.2% from a year ago when orders were $689.8 million.

Pertec Reports Record '75 Profits

EL SEGUNDO, Calif. – Pertec Corp. stemmed the tide of decreasing earnings with record revenues and profits for the year ended June 27. Revenues were up 46% while earnings rose 120% over those of last year, and the fourth quarter set records.

For the year, revenues rose to $48 million compared with $32.9 million last year.

Earnings totaled $2.8 million or 90 cents a share compared with $1.3 million or 41 cents a share in 1974, when there was a $1 million charge from discontinued printer operations.

During the fourth quarter, revenues reached $13.5 million compared with $9.5 million in the year-ago period, while earnings rose to $956,000 or 31 cents a share compared with $880,000 or 29 cents a share.

The 1974 results include $1.2 million from the sale of the firm's computer-output microfilm operation.

"This year's achievement marks a significant turnaround after three years of progressively declining profits," said President Ryal R. Poppa.

"Our Business Systems Division, which was unprofitable last year, recorded dramatic increases in both revenues and profits. Our Peripheral Equipment Division experienced a modest growth rate of 12% which was well below their anticipated revenues, yet was able to achieve almost 100% of their profit expectations," he said.

Sales Surpass Projections at MAI

NEW YORK – Management Assistance, Inc. (MAI) scored record earnings and revenues for the third quarter and nine months with revenues ahead of the projected 15% to 20% growth rate.

Sales of Basic/Four systems in nine months grew 47% over a year ago to over $30 million. Backlog for the Basic/Four exceeded $14 million, compared with $11 million at the start of the fiscal year.

Earnings for the third quarter, ended June 20, were $1.9 million or 7 cents per share compared with $1.2 million or 4 cents per share for the same period last year.

Revenues for the quarter totaled $24.3 million, 21% over the $20 million for last year's third quarter.

Tax credits in the 1975 and 1974 periods amounted to $818,000 and $652,000, respectively.

In the nine months, MAI earned $4.1 million or 14 cents a share compared with $1.7 million or 6 cents per share last year.

The nine-month period of 1975 reflects a credit of $928,000 after deducting a $592,000 write-off of a receivables from Potter Instrument Co., while in 1974 there was a $1.1 million tax credit.

Revenues rose 23% in the nine months to $69.1 million compared with $55.9 million for the same period last year.

Raymond P. Kurshan, chairman and president, said "Both earnings and revenues for the 1975 third quarter exceeded those of the first and second quarters."

"The improvements came from our domestic and foreign activities in sales of Basic/Four systems and in DP equipment service and maintenance," he said.

"MAI's achievements to date confirm our earlier projections that both revenues and net income will continue to rise and our overall performance for the year will set an all-time record," said Kurshan.

REI Improves Nine-Month Earnings Despite Special Credit Last Year

DALLAS – Despite a $2 million special credit last year, Recognition Equipment, Inc. (REI) managed to better earnings during the nine months, when earnings reached $2.1 million or 36 cents a share compared with $1.4 million or 26 cents a share in the year-ago period.

Revenues for the nine months rose to $42.5 million compared with $28.6 million last year. The $42.5 million includes $6.9 million, the value of a Trace system contract installed at First National City Bank. The company said it has essentially no profit impact from these revenues.

However, during the third quarter, although REI's operating income rose to $509,000 compared with a loss of $167,000 in the year-ago period, earnings were less than a year ago.

Earned $733,000

The firm earned $733,000 or 12 cents a share, including a $224,000 tax credit, compared with $2.1 million or 40 cents a share in the year-ago period, when there was the $2 million gain on restructuring convertible subordinated notes and $252,000 in tax credits.

Revenues for the three months rose to $13.5 million compared with $9.5 million in the year-ago period.

As of July 31, the backlog of firm orders totaled $41.5 million, including $858,000 for optical character recognition wands on an if-sold basis, up from $22.4 million last year.

Expansions

Honeywell will establish a facility to package integrated circuits located at the Las American Industrial Park in Chihuahua, Mexico.

Burroughs Corp. has purchased an 110,000 sq ft plant for the manufacture and engineering of its Series S document-handling systems in Wayne Township, Mich. The plant will provide the space needed for expansion of the Series S program and will provide additional space at the Plymouth plant for expansion of the Series L and Series TC programs.

Dataproducts Corp. has opened a 35,000 sq ft addition to assemble and manufacture printers for the European market in Dublin, Ireland.

Control Data Corp. has begun construction on its first European Cybernet computer center which will house two CDC Cyber 70 Model 73s and two IBM 370/158s. It will be located in Brussels, Belgium.

Versatec has moved to larger facilities in Santa Clara at the intersection of Kifer Road and Bowers Ave. The $4 million building of over 100,000 sq ft will house up to 500 employees.

Tymshare, Inc. has moved into larger headquarter facilities at 20705 Valley Green Drive, Cupertino, Calif. 95014.

Entrex, Inc. has leased space at 10010 Santa Monica Blvd. in Los Angeles for a sales and training office.

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Earnings Reports

COMPUTER SCIENCES
Three Months Ended June 27

	1975	1974
Shr Ernd	$.11	$.04
Revenue	50,367,000	39,733,000
Earnings	1,524,000	585,000

INTEL
Three Months Ended June 30

	1975	1974
Shr Ernd	$.52	$1.00
Revenue	31,501,000	36,223,000
Earnings	3,613,000	6,701,000
6 Mo Shr	1.06	1.99
Revenue	61,866,000	68,709,000
Earnings	7,305,000	13,304,000

COMPUTER INVESTORS GROUP
Year Ended March 31

	1975	1974
Revenue	$28,682,000	$23,231,000
Spec Cred	306,000	.....
Loss	4,230,000	1,812,000

WAVETEK
Three Months Ended July 5

	1975	1974
Shr Ernd	$.14	$.13
Revenue	2,434,300	2,366,700
Earnings	119,700	108,000
9 Mo Shr	.29	.53
Revenue	7,398,100	7,692,000
Earnings	247,600	454,300

DATA CARD
Three Months Ended June 28

	a1975	b1974
Shr Ernd	$.17	$.17
Revenue	3,184,000	1,929,000
Earnings	263,000	251,000

a-Includes operations of Troy division acquired in May. b-Restated to reflect accounting changes.

DATA DISC
Three Months Ended July 4

	1975	1974
Shr Ernd	$.03	$.02
Revenue	1,812,000	2,564,000
Earnings	30,000	20,000
6 Mo Shr	.....	.19
Revenue	3,499,000	4,949,000
Earnings	(66,000)	195,000

LITRONIX
Three Months Ended June 29

	1975	1974
Shr Ernd	$.10	.....
Revenue	13,332,000	$8,698,000
Earnings	252,000	(35,000)
6 Mo Shr	.17	.02
Revenue	23,663,000	15,446,000
Earnings	433,000	41,000

MACRODATA
Three Months Ended June 30

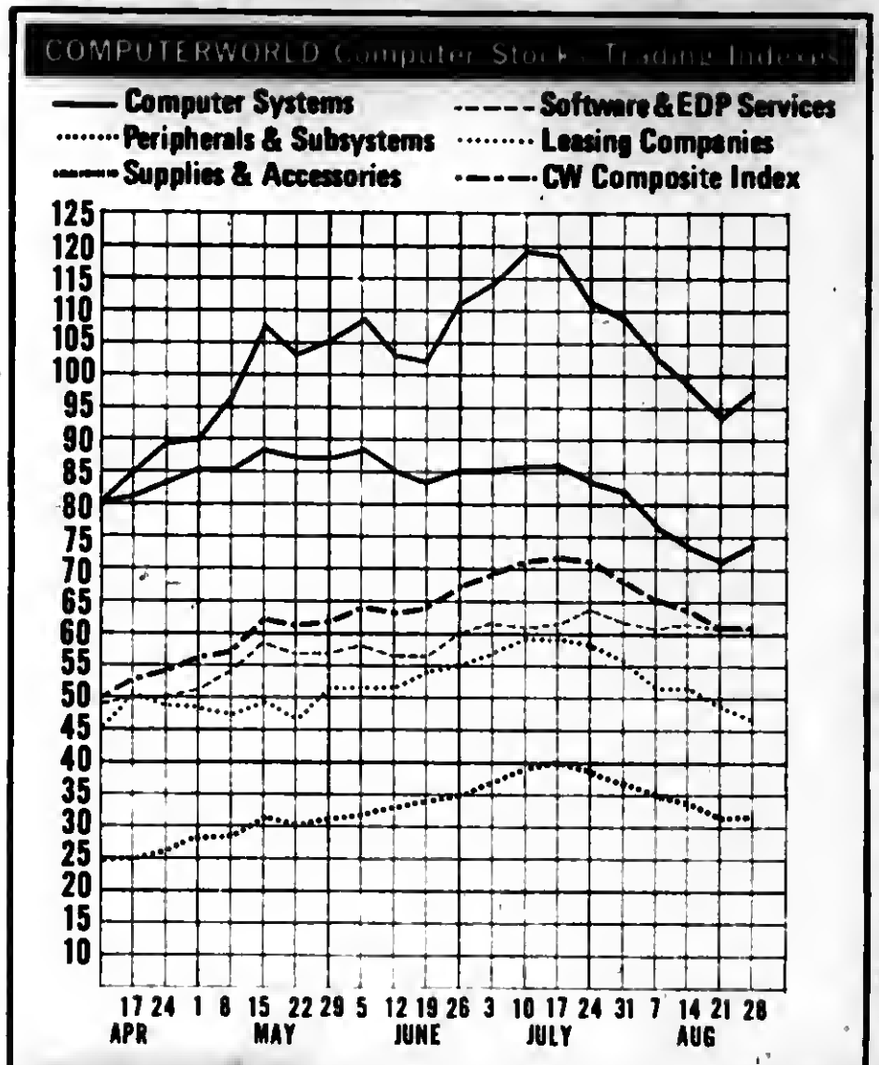
	1975	1974
Shr Ernd	.....	$.24
Revenue	$2,877,471	3,258,257
Earnings	(56,837)	238,530
6 Mo Shr	.11	.46
Revenue	5,885,980	6,258,333
Earnings	117,887	416,919

TALLY
Three Months Ended June 29

	1975	1974
Shr Ernd	$.09	$.06
Revenue	5,439,000	4,300,000
Tax Cred	20,000	41,000
Earnings	205,000	162,000
6 Mo Shr	.10	.11
Revenue	9,871,000	8,454,000
Tax Cred	55,000	73,000
Earnings	233,000	287,000

MODULAR COMPUTER SYSTEMS
Three Months Ended June 30

	1975	1974
Shr Ernd	$.20	$.18
Revenue	9,034,000	6,056,000
Earnings	594,000	485,000
6 Mo Shr	.38	.32
Revenue	17,706,000	11,012,000
Tax Cred	.....	188,000
Earnings	1,141,000	1,076,000



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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 27, 1975

All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE III	CLOSE AUG 27 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	88 5/8	+1 1/4	+1.4
O	COMPUTER AUTOMATION	2- 10	8	+ 1/2	+6.6
N	CONTROL DATA CORP	11- 23	16 1/4	+1	+6.5
N	DATA GENERAL CORP	10- 38	27 1/4	+1 5/8	+6.3
O	DATAPOINT CORP	6- 26	17 3/4	+1 1/4	+7.5
O	DIGITAL COMP CONTROL	1- 4	3 1/4	0	0.0
N	DIGITAL EQUIPMENT	46-122	110 5/8	+4 1/8	+3.8
N	ELECTRONIC ASSOC.	2- 3	2 3/8	+ 1/8	+5.5
A	ELECTRONIC ENGINEER.	9- 10	8 5/8	+ 3/8	+4.5
N	FOXBORO	23- 42	30 3/4	+ 3/4	+2.5
O	GENERAL AUTOMATION	6- 14	6 7/8	-1 1/4	-15.3
O	GRI COMPUTER CORP	1- 1	5/8	+ 1/8	+25.0
N	HEWLETT-PACKARD CO	58-120	92 1/2	-6 5/8	-6.6
N	HONEYWELL INC	22- 43	28 1/8	+1 1/4	+4.6
N	IBM	159-224	181	+4 1/2	+2.5
O	NEMOREX	1- 10	7	- 5/8	-8.1
O	NICRODATA CORP	2- 6	4 5/8	+ 1/8	+2.7
O	MODULAR COMPUTER SYS	5- 19	10 1/2	-1 1/2	-12.5
N	NCR	15- 39	26 7/8	+1 1/2	+5.9
O	PRIME COMPUTER INC	2- 6	5	0	0.0
N	PERKIN-ELMER	16- 30	23 1/2	+1 3/8	+6.2
N	RAYTHEON CO	26- 59	49 3/4	+2 1/8	+4.4
N	SINGER COMPANY	10- 17	12 1/4	+ 7/8	+7.6
N	SPERRY RAND	26- 49	40 1/4	+ 1/2	+1.2
A	SYSTEMS ENG. LABS	1- 5	3 1/8	0	0.0
O	ULTIMACC SYSTEMS INC	1- 6	5 5/8	0	0.0
N	VARIAN ASSOCIATES	7- 13	13 3/8	+ 7/8	+7.0
N	WANG LABS.	7- 17	17 3/4	+ 1/4	+2.1
N	XEROX CORP	51- 86	58	+5	+9.4
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	3 3/8	0	0.0
A	COMMERCE GROUP CORP	2- 4	3	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	3/4	0	0.0
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	1- 1	1/2	0	0.0
N	DPF INC	3- 6	4 1/2	- 1/8	-2.7
O	EGR RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	3 1/2	+ 1/4	+7.6
A	GREYHOUND COMPUTER	2- 3	2 7/8	0	0.0
A	ITEL	3- 9	5 7/8	+ 1/8	+2.1
N	LEASCO CORP	4- 8	6	- 1/8	-2.0
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	1- 4	2 3/8	- 3/8	-13.6
A	PIONEER TEX CORP	2- 7	5	- 1/4	-4.7
A	ROCKWOOD COMPUTER	1- 1	1/4	- 3/8	-60.0
N	U.S. LEASING	8- 14	8 7/8	+ 5/8	+7.5
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	1	0	0.0
A	APPLIED DATA RES.	1- 10	1 3/4	0	0.0
N	AUTOMATIC DATA PROC	29- 65	51 5/8	+1 5/8	+3.2
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
O	CENTRAL DATA SYSTEMS	3- 7	6 1/2	0	0.0
O	COMPUTER DIMENSIONS	2- 6	4	- 1/4	-5.8
O	COMP ELECTION SYSTMS	3- 6	5 1/4	0	0.0
O	COMPUTER HORIZONS	1- 1	3/4	- 1/8	-14.2
O	COMPUTER NETWORK	1- 3	2 3/8	0	0.0
N	COMPUTER SCIENCES	2- 4	4 1/2	+ 3/8	+9.0
O	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
O	COMPUTER USAGE	2- 4	2 3/8	+ 1/8	+5.5
O	COMSHARE	3- 4	2 3/4	- 1/8	-4.3
O	DATATAB	1- 2	1 3/4	0	0.0
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	18 1/4	+ 7/8	+5.0
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	3/4	0	0.0
O	KEANE ASSOCIATES	2- 3	2 1/4	0	0.0
O	KEYDATA CORP	2- 3	2 1/2	- 1/8	-4.7
O	LOGICON	3- 5	3 5/8	0	0.0
A	MANAGEMENT DATA	1- 3	1 3/4	- 3/8	-17.6
O	NATIONAL CSS INC	6- 14	17	+1 3/4	+17.0
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	9- 17	13 1/4	+ 1/2	+3.9
N	PLANNING RESEARCH	2- 6	3 7/8	0	0.0
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPICATA INC	2- 5	3 5/8	+ 1/8	+3.5
O	REYNOLDS & REYNOLD	10- 24	11	-1	-8.3
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	3/4	0	0.0
O	TYMSHARE INC	7- 21	16 3/8	+1 3/8	+9.1
A	URS SYSTEMS	2- 4	3	- 1/2	-14.2
N	WYLY CORP	2- 4	3	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	6 1/2	+ 7/8	+15.5
O	ADVANCED MEMORY SYS	1- 7	4	+ 5/8	+18.5
N	AMPEX CORP	3- 7	5 1/8	+ 3/8	+7.8
O	ANDERSON JACOBSON	1- 3	1 7/8	- 1/2	-21.0
O	BEEHIVE MEDICAL ELEC	1- 5	3	- 1/8	-4.0
A	BOLT,BERANEK & NEW	5- 13	10	+ 7/8	+9.5
N	BUNKER-RAMO	4- 8	4 5/8	0	0.0
A	CALCOMP	4- 7	4	- 1/4	-5.8
O	CAMBRIDGE MEMORIES	3- 5	3 3/4	- 1/9	-3.2
N	CENTRONICS DATA COMP	7- 25	15 1/4	- 3/4	-4.6
O	CODEX CORP	15- 38	29 1/4	+2 3/4	+10.3
O	COGNITRONICS	1- 2	1 1/8	0	0.0
O	COMPUTER COMMUN.	1- 2	1	0	0.0
O	COMPUTER CONSOLES	3- 7	4 1/4	-1 1/4	-22.7
A	COMPUTER EQUIPMENT	1- 2	1 3/4	+ 1/4	+16.6
O	COMPUTER MACHINERY	1- 2	1 3/4	+ 1/8	+7.6
O	COMPUTER TRANSCEIVER	1- 2	1 1/8	0	0.0
O	COMTEN	2- 5	3 1/2	- 1/4	-6.6
N	CONRAC CORP	12- 23	15 1/8	-1 3/4	-10.3
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	5- 16	9 3/8	+ 1/4	+2.7
A	DATA PRODUCTS CORP	2- 4	3 5/8	+ 1/8	+3.5
O	DATA TECHNOLOGY	1- 3	1 3/4	0	0.0
O	DATUM INC	1- 2	1 3/8	- 1/8	-8.3
O	DECISION DATA COMPUT	4- 7	4 3/4	+ 1/2	+11.7
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DIZAN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	1 3/4	+ 1/8	+7.6
O	FABRI-TEK	1- 1	1	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1 1/4	0	0.0
N	HAZELTINE CORP	3- 6	4	- 1/4	-5.8
N	HARRIS CORP	18- 28	23	+1	+4.5
A	INCOTERM CORP	8- 12	9 1/8	- 1/4	-2.6
O	INFOREX INC	2- 5	2 7/8	0	0.0
O	INFORMATION INTL INC	9- 14	11 3/4	- 3/8	-3.0
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	5/8	0	0.0
A	MILGO ELECTRONICS	9- 24	15 5/8	+ 1/8	+0.8
N	MOHAWK DATA SCI	1- 5	2 7/8	+ 3/8	+15.0
O	OPTICAL SCANNING	1- 3	3	0	0.0
O	RENATL CORP	2- 2	1 1/2	- 1/8	-7.6
O	RERTEC CORP	2- 8	4 3/4	-1	-17.3
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	3/4	0	0.0
O	QUANTOR CORP	2- 6	4 5/8	+ 1/8	+2.7
O	RECOGNITION EQUIP	2- 9	6 1/8	+ 1/8	+2.0
N	SANDERS ASSOCIATES	3- 11	6 7/8	+ 3/4	+13.7
O	SCAN DATA	1- 3	1 3/4	- 1/8	-6.6
O	STORAGE TECHNOLOGY	6- 17	12 1/4	+1	+8.9
O	SYCOR INC	5- 15	13 3/4	+1 1/2	+12.2
O	T PAR INC	3- 6	5 3/8	+ 1/8	+2.3
O	TALLY CORP.	1- 5	3 1/8	0	0.0
O	TEC INC	1- 4	3	0	0.0
N	TEKTRONIX INC	19- 41	32	-1 1/4	-3.7
N	TELEX	1- 3	2 1/8	- 1/8	-5.5
O	WANGCO INC	4- 9	5 7/8	+ 1/8	+2.1
O	WILTEK INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 1/2	+ 1/4	+5.8
A	BARRY WRIGHT	5- 7	6 1/4	- 1/4	-3.8
O	CYBERNATICS INC	1- 1	1/2	0	0.0
A	DATA DOCUMENTS	29- 42	34	+2 1/8	+6.6
O	DUPLEX PRODUCTS INC	12- 25	16	+1 1/8	+7.5
N	ENNIS BUS. FORMS	5- 7	5 1/8	- 1/8	-2.3
O	GRAHAM MAGNETICS	5- 13	8 1/4	+1	+13.7
O	GRAPHIC CONTROLS	8- 21	11 1/2	+1	+9.5
N	3M COMPANY	43- 68	53 3/4	+2 1/4	+4.3
O	MOORE CORP LTD	39- 51	43 3/4	+1 1/2	+3.5
N	NASHUA CORP	11- 22	12 1/4	+ 5/8	+5.3
O	STANDARD REGISTER	11- 20	15 3/4	+ 1/4	+1.6
O	TAB PRODUCTS CO	4- 8	5 3/4	0	0.0
N	UARCO	17- 24	19 3/4	- 1/4	-1.2
O	VARIER GRAPHICS CORP	4- 7	4 3/4	0	0.0
A	WABASH MAGNETICS	3- 5	4	+ 1/8	+3.2
N	WALLACE BUS FORMS	15- 25	18 1/8	- 1/4	-1.3

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COMPUTERWORLD

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DP Goes to School

Minireport Begins on Page 55

NEWSPAPER

DP for Education Moves Out of Labs

By John Hebert
Of the CW Staff

The computer as an educational tool has progressed from a position of relative mystery in the research centers and science laboratories of the 1950s to a fairly commonplace status in many U.S. high schools and most universities.

With the experience of nearly two decades under its belt, computer use in educational settings is only now advancing at a modest rate.

Last year, approximately 58% of all secondary schools in the country accessed a computer for administrative or instructional purposes, according to the results of a study of computer applications in secondary education conducted by the American Institutes of Research (AIR)

(Continued on Page 4)

Mitre Tells Air Force

6180 Has Best Security Potential

By Patrick Ward
Of the CW Staff

SPRINGFIELD, Va. – The Honeywell 6180 CPU is better able to provide a secure operating system than the Digital Equipment Corp. KI-10, IBM 370, Xerox Corp. Sigma 9 or Burroughs Corp. B6700, according to a report prepared for the Air Force by Mitre Corp.

The DEC KI-10 rated close to the Honeywell machine in being amenable to the user implementing a secure system, the report said. The 370 and Sigma 9, however, were both found "to be very difficult to use as bases for a secure system," and the B6700 would be an "extremely difficult" CPU around which to build a secure computing system, the report said.

Written by L. Smith and entitled "Architectures for Secure Computing Systems," the report made its judgments on the basis of how the architecture of the five machines compared with a list of 12 features Mitre feels would facilitate construction of a secure computer system.

"No existing system is secure from penetration attempts," the report said. This is true because no commercially available system has considered security as an absolute neeessity but, rather, only as a desirable feature and also because of "the inability to prove the absence of bugs in a large system."

"Theoretically, a secure system could be implemented on any machine, but some architectural features are extremely important to effectively implement a secure operating system," the report noted.

The Mitre group came up with its list of desired architeetural features both from a mathematical model of a secure system and from experience with nonsecure systems, the report noted.

Among the features are adequate access permission, variable and alterable access permission, continuous access checks, continuous space control, I/O access controls and others.

Mitre then ranked each of the five machines on whether a particular architectural feature is available in hardware, is partially available in hardware or must be simulated in software.

The Honeywell machine had six of the features available in hardware, twice as many as its closest competitors, and tied with the DEC machine in having the fewest number of features that had to be simulated in software.

The report then went on to a detailed

(Continued on Page 2)

Amdahl 470 Up to 130% Faster Than 2M-Byte 370/168 in Tests

By Patrick Ward
Of the CW Staff

ANN ARBOR, Mich. – A 2M-byte Amdahl 470 is performing various batch and on-line jobs 30% to 130% faster than a 2M-byte IBM 370/168 in tests at the University of Michigan Computing Center, according to Michael Alexander, senior systems research programmer there.

The Amdahl machine is halfway through a free, two-month evaluation period [CW, July 2] and "looks good," Dr. Robert C.F. Bartels, the center's director, said.

The university will have to decide to return either the 168 or Amdahl 470 at the end of the 60-day test period, Alexander said.

"At this point it looks almost certain the 168 will go," he said, even though a 2M-byte 470 with its standard 16 channels costs somewhat more than a 2M-byte 168 with eight channels.

The center has set processing-time usage charges 50% higher for the Amdahl than the IBM machine to take account of the 470's greater speed, Bartels said.

As far as programmers can tell, the Amdahl 470 is a faster 168, Alexander said. For example, he explained, the 470 needs more time for long-precision, floating-point operations than short-precision ones, but both are "much faster" than either short or long precision on the 168.

The 470 is running under the Michigan Terminal System, a virtual operating

(Continued on Page 4)

In Tarheel Triumph

Small Shop Builds Programming Palace

By Don Leavitt
Of the CW Staff

GREENSBORO, N.C. – Many IBM installations have enjoyed the benefits of interactive program development, of source program and procedure library support, of spooling printer output to disk and of accumulating job-accounting statistics.

To have all these facilities at once, however, DP shops usually have been big OS operations running under TSO or using a lot of independent software packages which the users had to interface once they were brought in-house.

But not at Carolina Steel Corp. here, which has an integrated on-line programming support system with all those features. The software was built in-house by programming manager Charles Rice and consultant Don Stoneman and runs on a 144K IBM 370/135 under DOS/VS.

Utilizing the system, a programmer can code, compile and test a program from a CRT terminal. The compiler listings are available at the terminal so the entire cycle, from coding to working program, can be completed in one sitting, noted Harry T. Parrish, Carolina Steel's manager of information services.

Parrish has a staff of six programmers sharing three IBM 3270s and the units are usually busy. The on-line programming support is operational at the same time as three batch partitions, the spooling capability and servicing of application work coming in from four CRTs located in user departments within the corporation's headquarters.

Developed over 18 months, the system has had two basic, obviously related benefits. Programmer productivity – most of the application programs are written in PL/I – has more than doubled, the manager noted, adding "this alone will pay for the development cost during the first year" of use.

Second, and more important in Parrish's view, has been the reduction in time his staff takes meeting user requests. "This has been a tremendous help in improving relationships with user departments," he said.

The system's support allows the programmer to create completely new programs or to modify source code already stored on the disk file. Pages of instructions can be skimmed on the CRT until the programmer reaches the place where changes are to be made. Immediately after changes are completed, the revised program can be compiled.

Utilizing the spooler facility, however, early compilations need not generate massive hard-copy listings just to get the inevitable diagnostic messages. Instead, the spooled listing can be directed to the programmer's CRT where problems can he reviewed and – hopefully – correeted.

When all errors have apparently been fixed, recompilation can be triggered, with that listing checked out on the CRT. And so the cycle can continue until the compilation is clean.

With the system's procedure library capability, the programmer can create Job Control Language (JCL) statements to test the newly compiled program or modify JCL already stored for a program that has reached production status.

Conditional parameters determine

(Continued on Page 2)

Users Who Ended Contracts Say Honeywell Tried to Take Specs

By Nancy French
Of the CW Staff

ST. LOUIS – Two users here have reported Honeywell service personnel attempted to remove wiring diagrams and related maintenance documentation from their computer centers in apparent retaliation for cancellation of maintenance contracts.

The users who reported the incidents said they came as a complete surprise. They had always believed things such as wiring diagrams belonged to them as owners of the systems, and Honeywell had never informed them otherwise.

Now Honeywell's St. Louis district service manager is contending they are the property of Honeywell and must be surrendered to the vendor after service contracts are terminated, the users said.

Lou Fox, vice-president of Emco Computer Services, a subsidiary of Elder Manufacturing Co., and Ron Fehr, DP manager at Pevely Dairy, reported similar experiences.

Fox said about two and one half months before the incident occurred, he canceled his Honeywell maintenance contract.

"It was strictly a cost decision," he said. "Honeywell was getting too expensive" and Raytheon Service Co. had offered him a better price.

Fox, in keeping with his agreement with Honeywell, gave Honeywell 90 days' notice of his intentions, he said.

One week before the termination date of his contract, two Honeywell employees came to his installation. One distracted him in his office while the second tried to remove the documents, he said.

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In Supreme Court Filing

IBM Says Telex Case Unworthy of Review

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – The Telex case "raises no issue worthy of review" by the Supreme Court, IBM declared last week in a filing with that court.

In the filing, IBM basically supported the decision of the appeals court, which found IBM not guilty of monopolization, while attacking the Telex filing to the Supreme Court.

The appeals court decision [CW, Feb. 5], IBM said, "is clearly correct. Moreover, if either of its two basic rulings is valid, its antitrust judgment must stand."

First IBM supported the appeals court contention that the market had to be defined more broadly than it was by the district court, which initially handed down a judgment against IBM.

The appeals court "correctly concluded" that "IBM was subject to a far broader range of competition than that embraced by the district court's relevant market definition," IBM said. "That decision is correct and is not in conflict with the decision of any other federal court."

Furthermore, "the court of appeals' decision corrected a novel and dangerous misuse of the Sherman Act," IBM said. "By combining condemnation of ordinary competition in the form of new products and optional short-term leases with an artificially narrow market definition framed in terms of the products of a single company and copies thereof, the district court opened the door to unjustified treble damage litigation which would suppress ordinary competition and flood the federal courts with groundless claims of monopolization," IBM added.

In addition, IBM claimed the appeals court finding that the firm had not engaged in predatory practices was also clearly correct.

"No federal court has ever suggested, much less held, that the introduction of new products and optional one- and two-year leases constituted a violation" of the antitrust laws, IBM said.

In fact, the purpose of those laws is "to encourage, not suppress, competition on the merits, such as the introduction of new products and new options in terms of trade," the IBM statement said.

The Telex appeal to the Supreme Court, IBM said, "has sought to argue its cause by repudiating the findings of the district court.

"In its petition [to be heard by the Supreme Court], Telex ignores the district court's findings against it and patches together a series of magazine articles, speeches and other nonrecord sources into a statement of 'facts' which is . . . wholly inconsistent with the record and findings" of the other courts, IBM said.

Small Site Now Program Palace

(Continued from Page 1)

which JCL statements apply if, for example, a program has to be able to run in either of two or more partitions.

Finally, the system permits the programmer to make "patches" in the machine-level code while the program is running. This comes very close to the console debugging practiced by programmers on earlier machines.

Once a change to a running program has been tested "live" through the patching facility, the programmer knows it will work and can make the corresponding change in the program's source code, Parrish noted.

Aids Management

Even while the system is providing programmers all these facilities, it is also accumulating accounting statistics for management including, for example, a daily transaction summary by partition.

This particular report covers such things as number of jobs and number of Abends, CPU time, I/O counts, phases and transients loaded and page fault statistics.

Other reports – which can be called up on the manager's CRT anytime – show data more specifically keyed to programmer productivity – who has done how many compiles and the like.

With information like that easily available, Parrish can keep tabs on his crew without being obvious and may be able to spot a project that's in trouble even before the programmer recognizes the fact.

Mitre Praises 6180 for Security

(Continued from Page 1)

commentary on how each of the machines matched up with the desirable security features.

While the B6700 "has many pleasing architectural features that are desirable to implement a secure system," it also has serious weaknesses, the report noted.

As for the 370, "the two major problems . . . are lack of adequate access variations and the availability of only two execution domains," the report said.

"These two features are the ones that security relies most heavily upon, making the 370 architecture one of the most difficult upon which to implement a truly secure computing system," the report stated.

"Architectures for Secure Computing Systems" is report number AD-A009 221, available for $4.00 from the National Technical Information Service, U.S. Department of Commerce, Springfield, Va. 22151.

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Users Report Honeywell Attempts to Repossess Specs

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"I was talking with one Honeywell fellow in my office and one of my operators came in and said another guy was out on the floor trying to take out our wiring diagrams. I told him to stop him."

Amid this confusion, Fox said, "I got a phone call from an employee at my other installation who said tbe same thing was going on there, and he asked me what he should do. I told him to stop the guys, but it was too late. The Honeywell engineers had gotten out of the building with the documents."'

Fox's attorney has contacted Honeywell's St. Louis district service manager to instruct him to return the documents, but at press time they had not been returned.

"As far as I'm concerned those materials belong to me," Fox said. "They came with the machine and they stay with the machine.

"What really bothers me about this whole thing is [Honeywell] never wrote me a letter or came in and said I had to get my own wiring diagrams. It just came in and stole them," he said.

"How can a company that has a salesman in here trying to sell me a new system stoop so low as to do a thing like that? As far as I'm concerned, forget Honeywell," he said.

Ron Fehr, at Pevely, described the incident in his installtion similarly. In his case, however, no documents were lost.

As Fehr told it, he had never had a maintenance contract with Honeywell, but had arranged for preventive maintenance service every fourth Wednesday morning, when the installation was almost down anyway. The dairy had been paying about $60 per hour for this service with a two-hour minimum, Fehr said.

Pevely had decided to handle maintenance this way when its first H-200 was installed in 1966, and it had been a good decision, Fehr said.

"About two months ago, on a Wednesday morning, a Honeywell engineer came in. I hadn't called him, but thought one of my operators had, which would have been all right," he said.

"During the course of conversation he told me no one had called, but that he heard we signed a maintenance contract with Raytheon Service Co. and he was there to pick up my wiring manuals," Fehr said.

"I told him then that I was going to stop him if he tried to take them, and he could just call his boss and tell him that." The engineer left without the manuals, Fehr said.

"Then on Friday, the engineering manager and the sales manager of Honeywell's St. Louis branch office came out to talk about it and I told them that if they wanted the manuals, they would have to take them by force. Then I told them I would call the police. They haven't come back since," he said, but added something else did happen.

About two weeks later, on the Wednesday morning when Fehr expected Honeywell field engineering in for preventive maintenance, no one showed up. "About 10 o'clock I called the response center – the 800 number – to find out what happened and was referred to the St. Louis district office.

"The engineering manager informed me I couldn't get service through the regular channels anymore, and that I had to be handled through his office on a special basis.

"The thing that got me mad about that was that his personal services are not available 24 hours a day or on weekends when I might need them," he said.

Since this difficulty occurred, Fehr said he has been depending on Raytheon for service on a per-call basis and has had no difficulties.

Fehr still has his wiring diagrams, he said.

Telephone calls to other Honeywell users in other locations indicated no other installations had experienced any difficulty over wiring diagrams.

Spokesmen from Burroughs and IBM confirmed that maintenance manuals, wiring diagrams and the like go along with their systems and are the property of the owner of the system.

According to Honeywell policy, a Honeywell spokeswoman said, maintenance manuals, operations manuals and instruction manuals are furnished with the systems and are the property of each customer.

However, "Honeywell owns all manuals which contain wiring diagrams and manuals on the theory of maintenance," she said.

She disputed the contentions of both Fox and Fehr, saying "Honeywell personnel did not attempt to steal any documentation."

According to information provided to her, there was no attempt to divert the DP manager at Emco-Elder. Engineers went to the site for the specific purpose of discussing the matter of the wiring documents, she explained.

"They left without the manuals when Fox threatened to call the police because they didn't want to make more of the matter than had already been made," she said.

Engineers did take the documentation from the second Emco site, where the computer was purchased under a contract which gave no rights to customers to retain documentation.

"Without a maintenance contract, the firm couldn't be allowed to rctain the wiring diagrams," she said.

Court Denies Request To Delay Xerox Sale

WASHINGTON, D.C. – Judge June Green has denied the injunction sought by John C. McWilliams and Associates, Inc. (JMA) to delay the sale of Xerox Corp.'s Data Systems Division [CW, Aug. 27].

JMA asked for the injunction to ensure that Xerox made adequate provisions to honor its contract with the Church of the Seventh Day Adventists here.

JMA still intends to file suit against Xerox, according to its attorney, Douglas J. Rykhus. JMA contends Xerox failed to modify standard software and provide test time as promised and technical support, Rykhus said. The church contracted JMA as a systems integrator of the Sigma 9 and 560 it ordered from Xerox.

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After Two Decades in Lab, CBE Making March Forward

(Continued from Page 1)

and funded by the National Science Foundation (NSF) [CW, Aug. 20].

Insofar as instruction is concerned, use of the computer in secondary education was found in 21.8% of all schools surveyed by AIR.

At the college and university level, computer-based education (CBE) – an encompassing definition of computers used to supplement or provide the basis for educational instruction – is "very widespread," according to Martin Rubin, a research scientist at Human Resources Research Organization (Humrro), and co-author of *Learning Alternatives in U.S. Education: Where Student and Computer Meet*.

Although updated figures of incidence rates in higher education are unavailable (no study has been undertaken since 1970), the instructional use of computers is "really a blossoming field that's working its way down the educational ladder," Rubin stressed.

Dr. Alfred Bork, chairman of the Association of Computing Machinery's Special Interest Group on Computers in Education (SigCue) and professor of physics and information and computer sciences at the University of California at Irvine, agreed there has been "impressive growth" in the educational use of computer systems, considering the problems in dealing with an application area as complex as education.

"It's spreading rapidly enough, but to create and use material is a slow process. I'm not worried about the [modest] rate – the relatively slow pace is only natural. There's a tremendous amount to learn," Bork admitted.

"The extent of [computer] use will ultimately be determined by judgments of appropriateness by subject experts, effectiveness observed from records of student performance and costs which must be met . . . by the schools," according to Karl Zinn, a research scientist and associate director of the Merit computing network at the University of Michigan.

The major problem shared at all educational levels is one of cost, even though it is well known, as Zinn stated, that "computing costs are decreasing even while capabilities are increasing."

At the level of secondary education, according to the AIR report, "the future of instructional computing is intimately related to the resolution of problems involving system costs, the exchange of information, utilization of available resources and individual and institutional receptivity to innovation."

Present limitations imposed by current computer technology at the university level, according to Zinn, "are the unreliability of processing lengthy verbal constructions and the inability to interpret bodily gestures or vocal intonation.

"But one of the most difficult problems remaining is lack of organization of the subject matter," Zinn stated.

Resources Not Utilized

But in U.S. public secondary schools, that problem is not at the forefront because of the small amount of time schools have had computing power.

"Out of the 1,459 individual computer-based courses listed by respondents, 43.2% were in mathematics. Obviously, there has been no major breakthrough of instructional computer applications into other than the more traditional math-oriented subjects," the AIR report found.

A major problem, then, is to use the resources now available. "The technological capability is here, it needs to be used," according to Karen Duncan, director of the office of computer resources at the College of Dental Medicine of the Medical University of South Carolina.

"The psychology of getting school faculties to author course programs is the next breakthrough that has to come in [computer-aided education]," Duncan explained.

470 Testing Faster Than 370/168

(Continued from Page 1)

system which the computing center originally designed for an IBM 370/67 and now uses on its 168.

Installing this operating system on the IBM-compatible Amdahl 470 took about two man-months with no discontinuity for the center's users. The only significant problem arose in converting the error-recovery aspect of the operating system, but that was not a major roadblock, Bartels said.

If the university had switched to a Burroughs or Control Data Corp. machine, the conversion effort probably would have cost about $2 million dollars, Bartels said.

The 470 currently offers Fortran G and H, Watfive and PL/I as well as Algol, Snobol, Basic, Assembly, APL and several others, he said.

The computing center expects "no problem" in interfacing either new IBM hardware or software products to the 470, Bartels added.

"We are looking forward to attaching IBM 3350-compatible fixed-disk drives to the 470 next year," he said.

So far, the university has had no more trouble interfacing its IBM-compatible peripherals to the Amdahl 470 than it had linking them to the IBM machine, Alexander said.

The Amdahl system provides the maintenance engineer with considerably more information on the internal state of the machine, he added. However, this information is not particularly useful to the user interested in computer performance evaluation, he said.

The 470's communications-handling ability is "no better or worse" than the 168's, except that the Amdahl system comes with 16 standard channels, he noted.

As yet, the university cannot fully utilize the additional power of the 470 because of a lack of memory due to a heavy paging load, Alexander said.

The university brought in the 470 knowing the 2M-byte capacity was insufficient for its range of applications, but "fully expects to go up to 4M bytes in a few years," he added.

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Exhibit Crowd-Pleaser for 10,000

By E. Drake Lundell Jr.
Of the CW Staff

TOKYO – Exhibitors and attendees alike were pleased with the exhibition in connection with the recent Second U.S.A.-Japan Computer Conference here.

More than 10,000 people visited the crowded exhibit area in the Tokyo Prince Hotel, with 1,000 of them registered for the full program of exhibits and seminars.

The quality of the exhibit attendees was kept high by a stiff exhibit entry fee, according to Ted Lorber of California Computer Products, Inc., (Calcomp) who was in charge of the exhibit part of the program.

Because of the high exhibit-only fee (about $100), the attendees were highly qualified and not the general public, he indicated.

And the reaction of the exhibitors seems to bear out that contention.

At Basic IV, for example, President Al Constintinas said the firm was seeing highly qualified contacts, even though it had not yet signed a marketing agreement in Japan.

"Japan is the one area of the world where we are not active at the present," he said. But because of the reaction from the attendees at the show, he indicated the firm would soon sign a marketing agreement with a Japanese trading company or manufacturing firm to market the firm's small business system there.

Calcomp also used the show to help launch several disk products into the Japanese market and indicated that prospects at the show showed particular interest in the Trident floppy disk system as well as larger disk units on display for OEM sale.

At Tally, which has been marketing its printers in Japan for some time, Robert Maddy, international marketing liaison director, said response at the show had been "tremendous" and the firm could expect some sales directly from its participation.

At the same time, the mainframe makers, which included IBM Japan and NCR plus the homegrown Fujitsu and Hitachi, packed attendees into their constantly crowded booths with demonstrations mostly of peripheral gear.

While there were some products on display for end users, primarily from the mainframe makers, most of the equipment on display was directed at OEMs, particularly by the U.S. firms that hope to crack the Japanese market by having their units integrated into other systems that would be marketed and maintained by Japanese firms.

"We really can't afford to have a maintenance operation here," one explained. "But the market is growing so fast we don't want to be left out of the action."

At the same time, there was little on display that would be considered new to U.S. audiences.

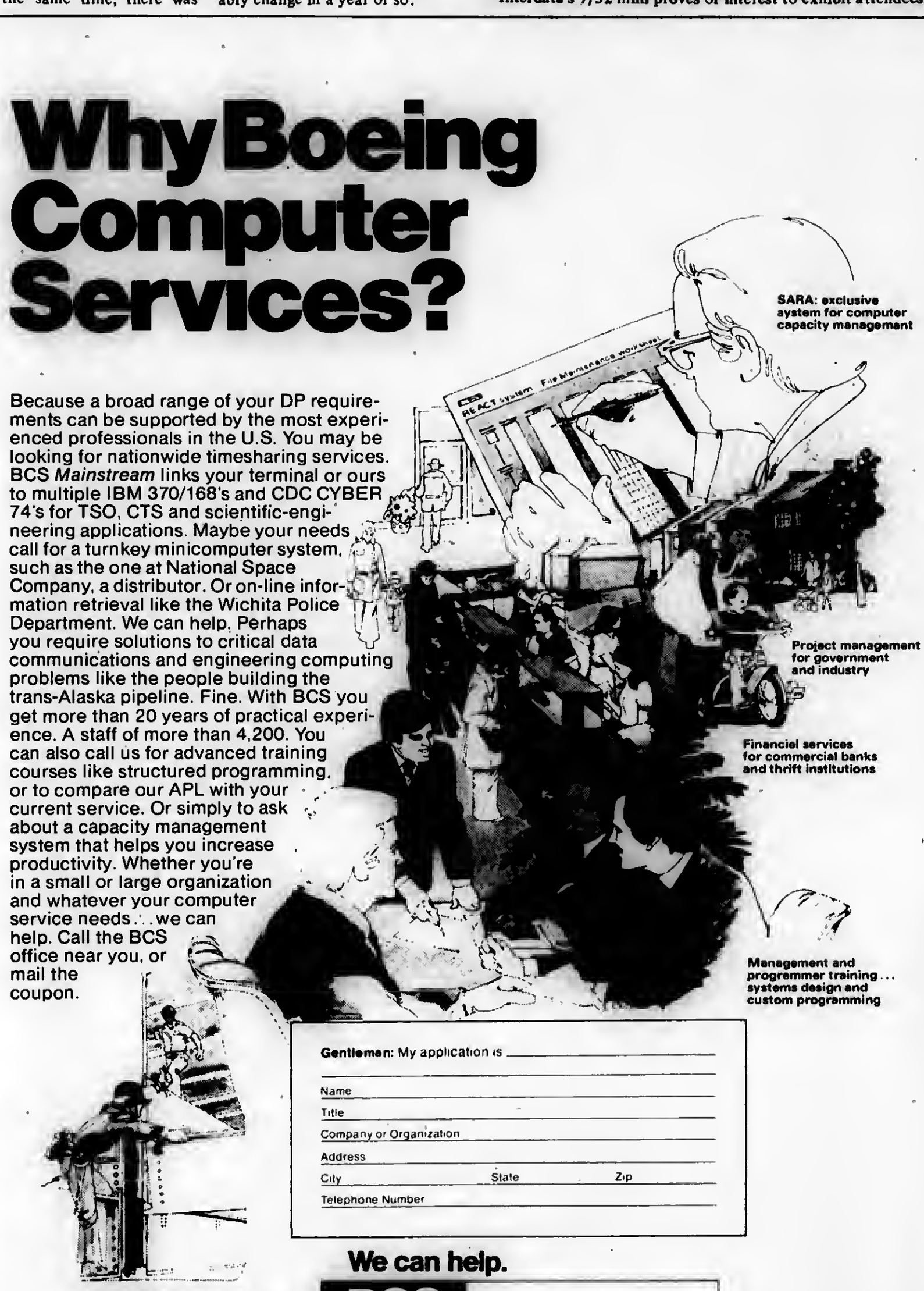
The minicomputer revolution was also largely absent from the displays. No large U.S. minimakers, with the exception of Basic IV, participated and few Japanese firms emphasized mini products.

"The full-scale, large mainframe is apparently still the way to go here," one U.S. marketing man said. "But that will probably change in a year or so."

CW at U.S.-Japan



Interdata's 7/32 mini proves of interest to exhibit attendees.





Calcomp shows off its disk drives.

System Design Must Account for Public Attitudes

By E. Drake Lundell Jr.
Of the CW Staff

TOKYO – The attitudes of the public at large and the impact of automation on society must be "taken into account" when designing new systems, Dr. Lewis M. Branscomb said at the Second U.S.A.-Japan Computer Conference here recently.

"Research in computer science and technology must ultimately relate to the well-being of the societies in which we live," Branscomb, IBM's vice-president for research, told the 1,000 attendees at the meeting.

At the same time, computer science draws on many different disciplines and many of the "really promising" ideas in the field arise "unexpectedly from the fields of basic science," Branscomb said.

Therefore, "it is important to recognize how much computer science draws on these disciplines and to emphasize the importance of keeping computer science and the industry it supports open to new ideas and in a position to stimulate these ideas," Branscomb added.

Furthermore, as the complexity of the man-machine interface continues to grow in computer systems, the number of basic science fields that have to be considered by the computer scientists will also grow, Branscomb said.

"Thus every effort should be made to keep the community of computer science and technology researchers in good contact with their colleagues in other disciplines," he added.

Nature of Systems

With the exploding growth of new technologies, their application has to be guided by systems considerations which should lead toward more research on the nature of systems, he said.

"In the past, the rate of progress in semiconductor device technology has been so great that research projects on new system architectures have been in danger of obsolescence on economic or technological grounds before they have had a chance to mature," he stated.

The proper choice of architectures, however, "is essential because these architectures must be guided by increasingly complex applications environments," he said.

Therefore there is a need to devote research time and effort to looking beyond the immediate impact of these new technologies and to inquiring about their "ultimate limitations," Branscomb said.

"We must ask ourselves – putting economics aside for the moment – what ultimate limitation do the laws of physics and chemistry place on continued progress in the present state-of-the-art in a given area?

"Then for each of the promising radical alternatives to today's technology, we should ask a similar question: Does this idea have the potential of ultimately being far superior to today's technology?" Branscomb said.

In this way, scientists will avoid putting too much effort into the development of technologies that do not have great ultimate potential and "which are likely to be made obsolete before they mature," he said.

Over the past 25 years, improvement in performance has averaged around 40% annually in computer systems, Branscomb said, noting that "in this circumstance, it is well to look as far ahead as we can in making technical choices."

Consideration for Users

Another element in the strategy for research in the computer field is to be guided by the user's point of view, according to Branscomb.

"Indeed, when we think about the economics of computing, we must think of the user's total cost, not simply those attributed to his data processing installation," he said.

"As information-processing technology matures, the user will be more and more interested in the ease with which new applications can be developed, installed and upgraded, in system availability and reliability, in recovery after failure and in the reduction of complexity with which he must contend," he predicted.

CW at U.S.-Japan

Therefore the technology of terminals will become extremely important, Branscomb said, as will the techniques needed to make the system transparent to the ultimate user.

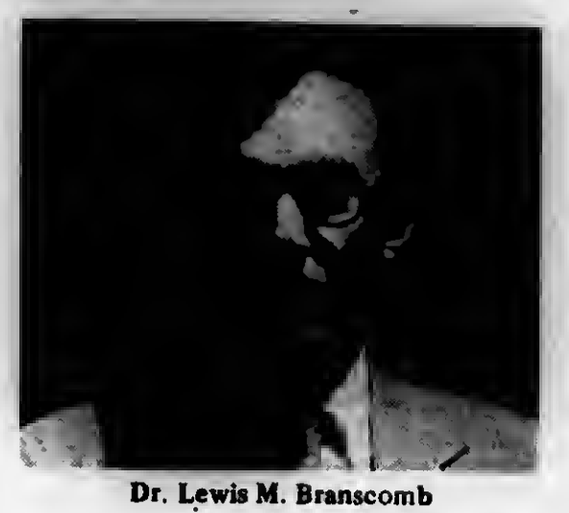
The complexity of systems and their scope will have to be balanced against the ease of use of the system, he said.

Computer scientists will also have to get involved with behavioral questions in the future, Branscomb said.

"If information systems of the future are to adapt to people and to human institutions rather than continuing to force people to adapt to machines, then systems architecture and the man-machine interface must be understood in their human dimensions," he said.

So far the "behavioral aspects of information science have not yielded to any significant research progress," he said.

"Nevertheless, computer scientists cannot avoid what are ultimately behavioral questions; they show up in the design of data structures, in the engineering of a storage hierarchy, in the specification of the speed and size of cache memory, in the allocation of resource control in a computer network," he said.



Dr. Lewis M. Branscomb

"The scope and difficulty of these issues on the 'people frontier' goes far beyond what is conventionally meant by 'human factors.' They offer the ultimate challenge to computer science research," Branscomb concluded.

"Impartial judgments are confirming our own analysis – we have a Mass Storage System that outperforms the 3850 by a significant margin"

An interview with Arthur Hausman, President of Ampex Corporation

Q. Mr. Hausman, what's so new about the Ampex TBM Mass Storage System?

A. The TBM Mass Storage System isn't being announced as a "new product." We delivered our first system in July of 1972. It's been a very successful installation with better than 98% uptime.

Q. Then why haven't we heard more about the Ampex Mass Storage System until just recently?

A. We had two very good reasons for biding our time. First, we wanted to evaluate and test our first installed system under actual field conditions. This system has demonstrated high reliability and superior performance. Our second reason for waiting was related to market conditions. Now we think mass storage has reached maturity. IBM's announcement of the 3850 Mass Storage System has confirmed our judgment that the time is ripe for MSS.

Q. How does IBM's announcement of the 3850 Mess Storage System affect Ampex's position in the mass storage market?

A. Quite frankly, we are elated that IBM has joined us in the market. Interest in MSS technology has skyrocketed since they announced the 3850. IBM users are evaluating the performance of both the Ampex and the IBM systems. And from what we hear, the impartial judgments are confirming our own analysis—we have a system that outperforms the 3850 by a significant margin.

Q. Can you compare the two systems?

A. I'm not sure. IBM designed the 3850 to serve a very specific segment of their own equipment users. The 3850 is designed for a batch environment, operating under OS/VS. If you're in that category, you're a potential customer.

On the other hand, the Ampex TBM Mass Storage System satisfies a much broader range of user situations, such as interactive, OS/MVT and multi-host environments containing both IBM and non-IBM mainframes. TBM Mass Storage System users have a much wider range of operational and growth options.

Q. Speaking of other mainframes, how will those manufacturers meet the IBM challenge in the area of mass storage?

A. We hope they'll do it with the Ampex TBM Mass Storage System. We feel we offer OEMs better performance and field-proven hardware, which could place them ahead of the competition.

Q. What about interfacing the TBM Mass Storage System to other mainframes?

A. We have interfaces for CDC, DEC and IBM 360 and 370 OS/MVT. Others are under development.

Q. Let's talk about reliability and performance, since they seem to go hand-in-hand. Can you capsule the Ampex claims?

A. Reliability is a combination of our technology and our field experience. The TBM Mass Storage System uses a technology based on Ampex equipment that has been in the field for 19 years. In all that time, nobody has developed a better recording technology. The performance of the TBM Mass Storage System is the result of eleven years of MSS experience. Our mass storage people are experts.

Q. The word flexibility keeps coming up in these discussions. What does it mean in relationship to a potential user of a TBM Mass Storage System?

A. The TBM Mass Storage System is extremely modular. Basic capacity is 11 billion bytes on-line, and it can be expanded in increments of 11 billion byles as required by the user. You can begin with fairly modest I/O capacity and some basic access times, and build to just about any performance rating you need. The competition only offers an incremental package of 67 billion bytes plus additional I/O channels every time the system is expanded. The cost is substantial.

Q. Who qualifies as a prospect for mass storage systems?

A. Anybody with large off-line computer tape libraries and a lot of on-line disk drives. The TBM Mass Storage System puts the tape library on-line and substantially reduces the number of disk drives required to support the CPUs.

Q. The idea of having your data base on-line is exciting. But is it cost-justified?

A. The labor for human intervention—mounting and demounting computer tapes—is costly. Delays in processing and job scheduling on the CPU are very important determinants in efficiently utilizing CPU time. Storing a million bytes on-line with a 3330 type disk drive costs approximately $6.50 per month; storing the same data on mass storage costs about 50¢ a month.

Q. Doesn't the integration of a mass storage system into a customer's operation imply substantial software modifications?

A. The Ampex TBM Mass Storage System was the first to offer disk staging and destaging of data from the mass storage system to the host computer. The IBM 3850 utilizes the same technique. Our user transparent interface makes the TBM Mass Storage System appear to the host computer as an infinite number of on-line 3330 type disk drives.

Q. What is your opinion regarding the future of mass storage systems?

A. We know there is a substantial market for on-line mass storage systems. Off-line tape and disk libraries are incongruous with the power available in today's computers. We believe that thousands of mass storage systems will be installed during the next several years. Those projections are substantiated by the number of 3850s which IBM has been reliably reported to have on order. Ampex is confident that the TBM Mass Storage System will gain a respectable share of this growing market.

Thank you, Mr. Hausman.

(Your letterhead inquiry will be answered with a free copy of our brochure titled *TBM The Ampex Mass Storage System*. It's important reading for executives with data processing responsibilities).

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But Not as General-Purpose Robots

Process-Control Systems to Bring Major Cost Savings

By Edward J. Bride
Of the CW Staff

TOKYO – While there may be no such thing as a general-purpose robot, the state of the art in programmable process-control systems, including visual parts inspection, is about to bring major labor cost savings to industry.

This was the consensus of speakers at several different sessions oriented toward industrial automation, pattern recognition and artificial intelligence during the recent Second U.S.A.-Japan Computer Conference here.

The goal of some of this research in these fields is to do a better job than human beings in such complicated areas as designing earthquake-proof buildings and automating traffic flow.

But a spin-off benefit has been reductions in work forces during a period of worldwide inflation and unemployment, though the employment picture is less severe here than in much of the rest of the world, according to speakers.

An "upgrading of manpower use," rather than replacing people, was the result of installing a digital computer to control three batch reactors used to produce lubricating oil additives.

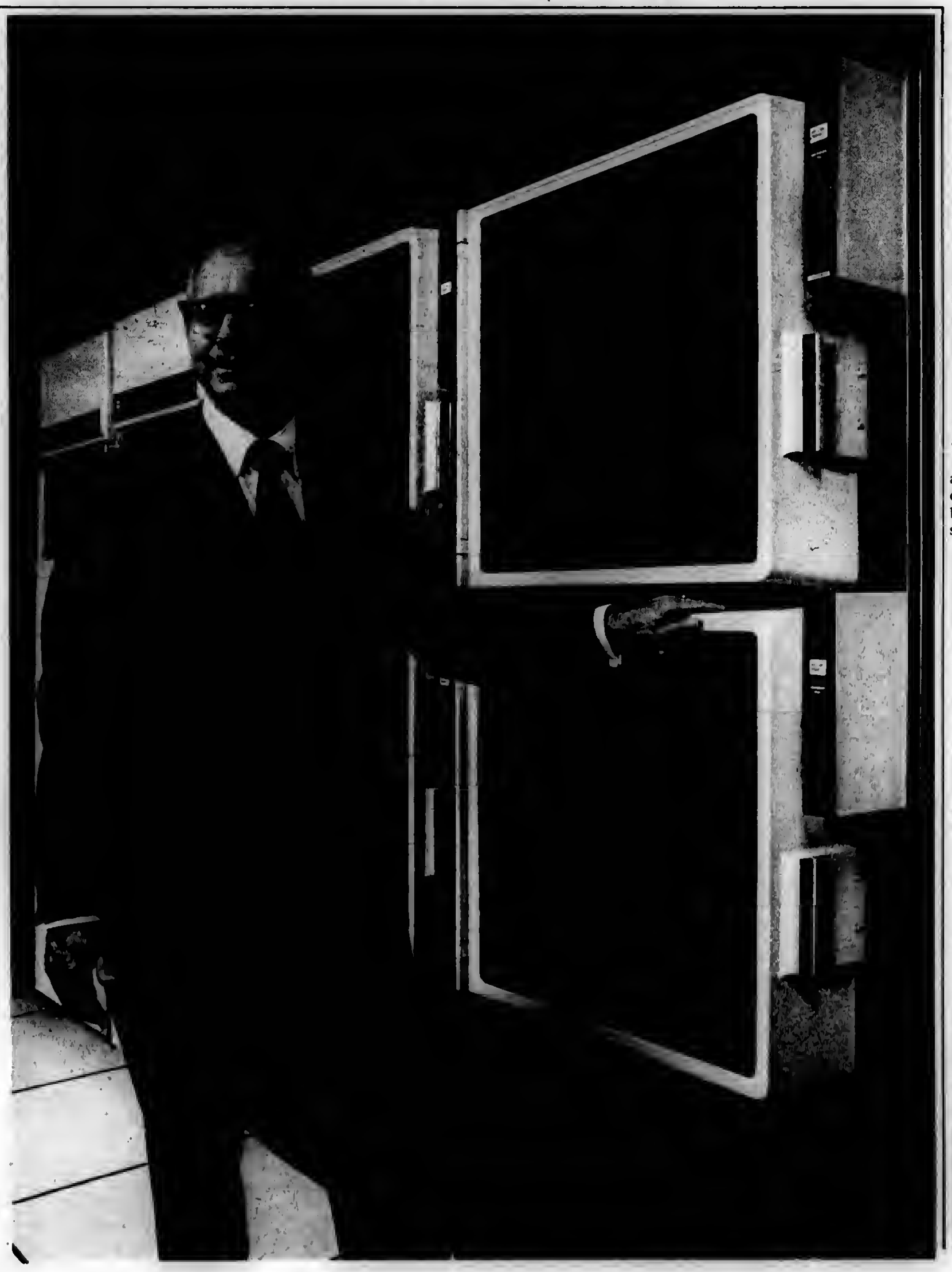
As described by Glen R. Nieman of Fisher Controls Co., the system improved product quality, eliminated waste and brought higher productivity than older methods of manually adjusting temperatures or having humans decide on the proper time to add raw materials and control pressure in these batch reactors.

"An additional benefit," said Nieman, was the release of head operator time which was previously used to back up a busy operator.

Gaining Wide Acceptance

Generalizing on the results of several case studies in industrial control, Nieman said computer-based process control systems are gaining "wide acceptance in industry." He credited several factors for this gain: improvements in computer performance, reliability and ease of programming, coupled with reduced hardware costs.

CW at U.S. - Japan



He also claimed computer controls in such industries as pulp and paper and ammonia plants are "becoming a routine matter," with resultant improved efficiencies and pay-out periods which are commonly "less than a year."

Looking more to the future, representatives of the Stanford Research Institute's Industrial Automation Project said many techniques for visual inspection – combining cameras and computers – "are ready for cost-effective factory applications."

These techniques would be used both for parts recognition to assemble parts for assembly lines (separating them from common conveyor belts, for example) and for inspection to remove rejected parts from such conveyors.

A large, time-shared Digital Equipment Corp. Decsystem-10 was used to develop digitizing algorithms to perform such inspections as assuring the proper placement of holes in lamp bases, the sizes of holes in piston connecting rods and the location of handles on various parts to facilitate robotic movement of these parts.

While a large computer was used to develop these algorithms, they can actually be run on a PDP-11 mini with 28K of 16-bit core memory, according to researchers Gerald J. Agin and Richard O. Duda.

They noted in defining a "standard material-handling problem," such as the acquisition of parts from a moving conveyor belt that, if the "identity, location and orientation of a part are all accurately known," a manipulator "can be programmed to acquire the part without the need for sensory feedback."

However, maintaining this control is expensive, and "the versatility of an industrial robot can be greatly increased by adding visual sensing."

In using a camera placed over the belt and in using their algorithms, the amount of additional work which may properly be called "programming" is "fairly small," they said.

Their display-based interactive methods for designing and reprogramming the vision system require "significant computer facilities" only during the design phase, they said.

The resulting procedures, they continued, can be executed on minis, proving "indispensible in introducing these methods into the factory."

In a separate panel session, Agin cited the benefits of such artificial intelligence research, noting there are important social implications for workers in the factory.

"Industrial manipulators," he said, can work "in hostile or unsafe environments, lowering accident rates and health problems." They can take over "dull, repetitive assembly line work," he continued, "freeing workers to operate, train and maintain the machines."

Furthermore, rather than eliminating jobs, he said, artificial intelligence in industrial applications "can permit the same number of workers to produce a better quality product."

Meir Weinstein, of the California Institute of Technology, commented that there is no such things as a "general-purpose robot," and even when the intent is to construct a machine which can learn about its environment, this will result in performing a specific task.

In a paper on "graceful degradation" of the traffic control system on Osaka, Japan, Toshiharu Hasegawa of Kyoto University cited the need for operator training as well as hardware trade-offs.

In the latter case, for example, he noted that the mean time between failures can be less important if the mean time to repair is very short.

Will Improve Human Knowledge

DP Seen Important Tool in Building Future Society

By E. Drake Lundell Jr.
Of the CW Staff

TOKYO – "Information technology will be an indispensable factor in contriving the post-industrial society to come," Bunichi Oguchi said at the Second U.S.A.-Japan Computer Conference here.

At the same time, information technology will he a powerful tool "to rationalize industrial operations and services" to construct an active and wealthy society, according to Oguchi, who is director of the Research Bureau at Nippon Telegraph and Telephone Corp.

The most prominent feature of postindustrial society will be that it is based on service industries, Oguchi said, such as commerce, trade, finance, transportation, recreation, health care, education and research.

The quality of that society will be evaluated by the available services and the amenity of life and not just by the production capacity of that society.

"Further, the growth of the postindustrial society will be governed through planning and forecasts, based on theoretical knowledge," he said.

"In this type of society, information and knowledge will occupy supreme positions, and computers and telecommunication systems will be indispensable tools for major activities such as service rationalization, forecast making, social planning and decision making," Oguchi predicted.

Therefore, while other technologies tend to improve the physical environment for man, Oguchi said computer and telecommunication technologies possess the potential to "directly influence and improve human knowledge and understanding, decision making and cultural patterns."

CW at U.S.-Japan

Specifically, Oguchi said computers should be used to rationalize production by economizing energy and resource consumption and by increasing the reuse or recycling of materials in short supply.

With this effort, computer systems should also be used to eliminate environmental pollution factors which accompany the production process, Oguchi said.

But, since the postindustrial society will be based more on the service to the people of that society than on production figures alone, there will be a wider role for computer systems, he said.

For example, computer systems will have to be used to improve current medical services and to provide a greater degree of security for a nation's people through such things as improved traffic systems aimed at reducing or preventing accidents.

The key to accomplishing all of this will be a "data communication system utilizing computers, telecommunication networks and terminals, he said.

Such a system will permit real-time decision making by gathering, recording and processing a wide range of data concerning such activities as medical service, traffic control and environmental pollution surveillance.

And, while an effective data communications systems will be able to provide such services, he also said it would "consume a smaller amount of resources and energy and, moreover, cause less environmental pollution," than any other system for delivering the same services.

"In the future, if information technology is to be uniformly infused into a society, it will be essential to link It with social science as well as various other sciences and technologies," he noted.

"With the appearance of a global data communication system, people around the world should be able to communicate and cooperate with each other, thereby maintaining a uniform flow of information and knowledge," he said.

However, he noted that information technology is a double-edged sword.

"Unless properly controlled, it can be misused to invade the privacy of others, to build a controlled society or may even cause terrible disorder in case of possible system failure.

"Moreover, the system derived through information technology must harmonize with human behavior and social customs if It is to be accepted in a society.

"It is the technologists' responsibility to try to enhance the benefits and eliminate the risks of information technology and, at the same time, to clarify both these facets of information technology to the outside world," he concluded.

On-Line Library Search Having Unexpected Results

By Edward J. Bride
Of the CW Staff

TOKYO – Aside from the expected benefits of making better use of librarians' time, the use of on-line search methods has had some unanticipated side affects, according to several speakers at the Second USA-Japan Computer Conference here.

Two researchers from the Lockheed Palo Alto Research Laboratory, in examing the goal of "providing the public with on-line access to large bibliographic data bases," found a relatively elite segment of the public was getting that access.

After a year-long experiment with public libraries in northern California, researchers Oscar Firschein and Roger K. Summit have discovered "most of the users are technical professors and students . . . highly educated," with 60% of the users having had "some graduate work" and 40% having advanced degrees.

The libraries have also begun to see a "new class of patrons, people who previously did not perceive the public library as a source of answers to complex reference questions," they reported.

Chief among this new class of patron is the government itself.

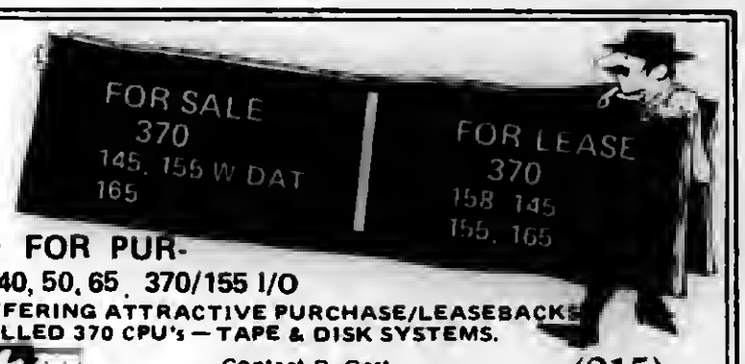
Two advantages of networks of shared files by several libraries were cited by Frederick Kilgour of the Ohio College Library Center in Columbus, Ohio.

First, Kilgour said such networks "can make available vast information resources to individual library users," plus there are economic advantages.

"At the same time that a network is increasing the availability of resources, it also makes possible reduction in rate of rise of per-unit library costs" bringing them "into line with the rate of rise of per-unit costs in the economy as a whole," Kilgour said.

It has been shown, for example, that the Ohio center has enabled cataloging staffs in Ohio academic libraries to increase productivity by 460%, Kilgour said.

By last February, Kilgour noted, about 475 institutions in 36 states were either participating in the Ohio network or had signed to participate.

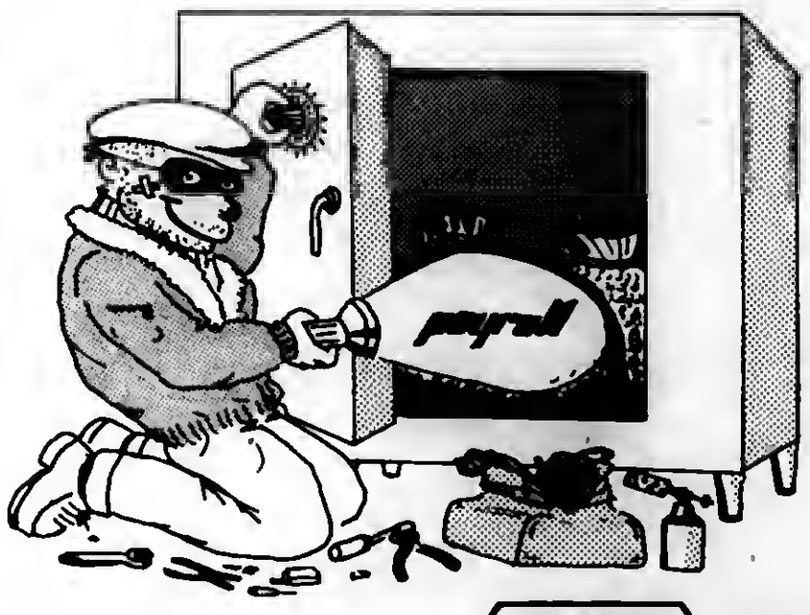


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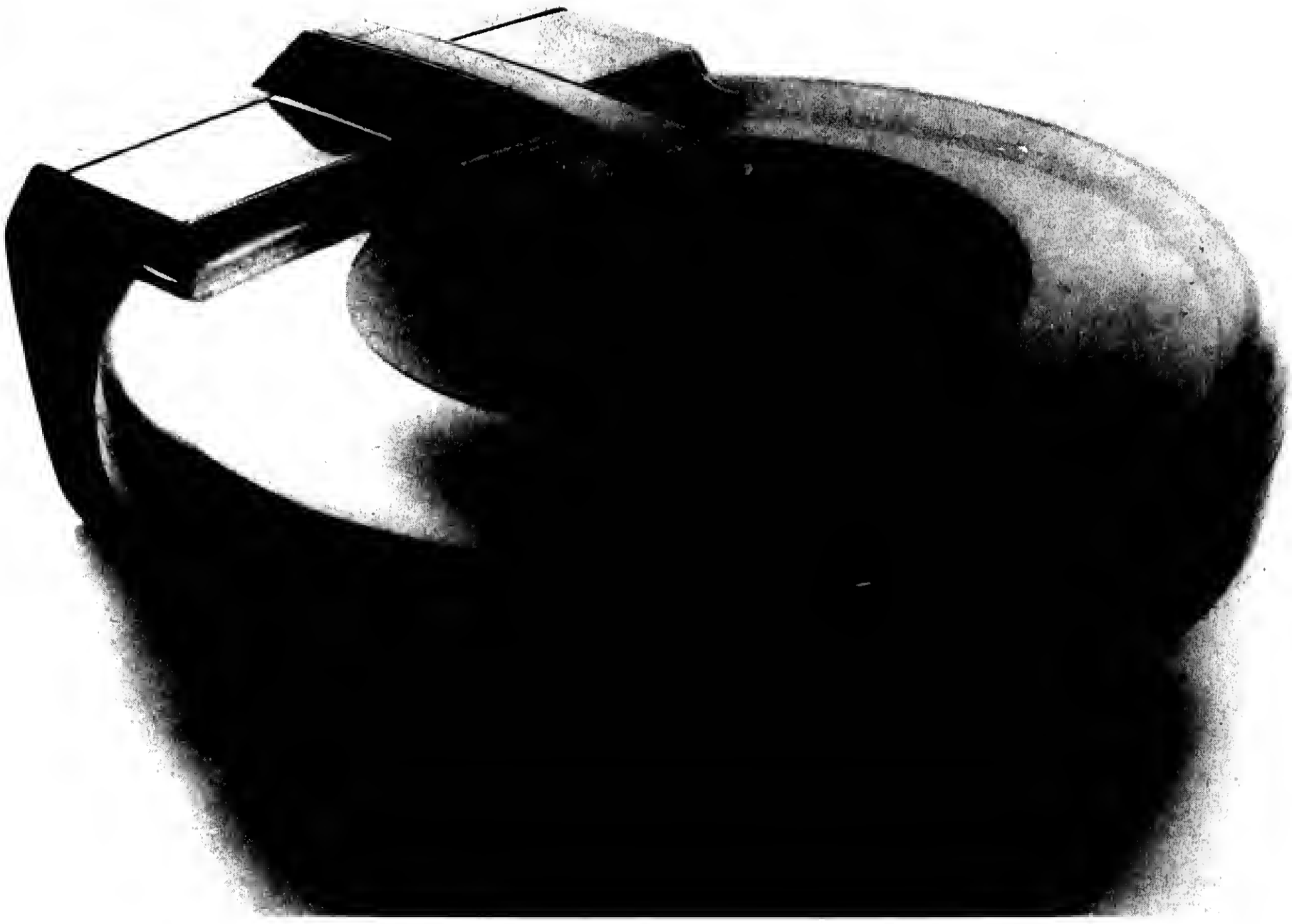
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CRT Provides Agency Data

GREENSBURG, Pa. – If Susan Whitney, age 56, of Murrysville, needs low-income housing, she can find the right public agency to assist her by consulting a computer terminal.

The terminal will even tell her who to call and how to get there.

This information is the result of a computerized central information service which has been instituted at the Office of the Aging here to help Westmoreland County residents. While aimed primarily at those over 60, it will assist anyone over 18 or minors accompanied by a guardian.

The center, administered by the state Department of Welfare and funded with a grant from the federal Department of Health, Education and Welfare, serves only as a referral point and does not itself provide any services.

The terminal is connected to a central computer located at the MonValley Health and Welfare Council in Monessen, Pa. Some 260 agencies serving Westmoreland County are on file, along with more than 900 agencies serving seven other Pennsylvania counties.

The agency services covered include social services, recreation, employment, health, housing and transportation, among others.

When an individual calls or comes into the office, he simply states his problem, age, sex and residence area. No names are recorded.

This information is keyed into the terminal and the computer responds with the names of one or more agencies in that particular area which can help.

In addition to the agency name, the CRT display includes a telephone number, the name of a contact person at that agency, whether an appointment is needed, whether the agency provides transportation or is accessible by public transportation and any eligibility requirements.

This last notation, according to April Brown of the Greensburg office, allows her to prescreen the candidates.

"Some agencies only take welfare recipients, for example," she said, "and this way we can save the person a useless trip by telling him he is ineligible.

The MonValley center sends each county office a monthly report which lists no names, but does break down the recorded data into numbers served, sex, age and agencies involved.

These reports, Brown stated, will be used to determine where more work is needed and to keep track of the ages and types of problems most frequently encountered.



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Study Uncovers Mismanagement of Navy DP Resources

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – The U.S. Navy has installed or is installing late-model computer equipment for systems which are in many cases not fully standardized, inadequate and not designed to exploit the latest computer technology, according to a report to Congress.

As a result of the study, conducted by the comptroller general's office, several recommendations were put forth, including increased documentation of systems studies and the establishment of monitoring procedures to ensure compliance with Navy policies.

A review of the Navy's management of DP resources was made to determine how effectively that body is using those resources, which cost the government some $300 million a year, the report said.

Program 'Having Difficulty'

Findings disclosed "the Navy's Automatic Data Processing Program is having difficulty achieving its major objectives, particularly in its efforts to develop standard information and data systems – which are the key to the program's objectives – with standard equipment on a command and functional basis."

The comptroller general's office concluded the government is, therefore, spending millions of dollars to "sustain efforts beyond their scheduled completion dates and to operate and maintain standard equipment acquired for those systems, without achieving expected benefits, and to retain older computer equipment because of system delays."

The funds were being used to design, develop and maintain interim and nonstandard systems operating on that equipment and to supplement saturated computers with commercial computer time, the comptroller said.

For example, the report said the Naval Ordance Command will spend some $17 million through fiscal 1975 to sustain the development of its Management Information System for Ordnance Production Activities beyond its scheduled full implementation date of December 1968.

This expenditure, the Comptroller noted, is the result of difficulties encountered in the multilead activity concept and the redirection of effort after centralizing system development.

Major Stumbling Block

Standardizing, the Navy's major stumbling block, has not been successful "because Navy management allows local commanders to influence unduly the design of standard systems," the report said.

This has resulted in the modification or development of systems which fit local needs, but do not conform to the Navy's overall DP objectives and needs, the report continued.

"The department's management has not been effective, primarily because of the underlying problem of command influence," the comptroller said. "That problem remains under a new management system initiated in 1970 and will not be resolved until the department more strictly controls systems development."

In accordance with this finding, the Comptroller forwarded several recommendations to the secretary of the Navy, suggesting he:

- Require that system studies be documented and that the documentation be part of the equipment justification.
- Review the Navy's information and DP systems to identify, on a system-by-system basis, those actions needed to establish a program for upgrading and standardizing each system.
- Issue to the commands more definitive guidance for making economic analyses.
- Amend his instructions for redesign to require that the alternatives of redesign be considered as part of any economic analysis made to support system projects.
- Require the director of the Navy's DP management to establish monitoring procedures to ensure compliance with redesign policy.

Bank Project Finds Information Terminal Requires Promotion

ROCHESTER, N.Y. – An experimental customer information terminal here at Lincoln First Bank of Rochester invites checking customers to obtain balance information on their accounts directly from the computer.

Installed to measure customer reactions to automated banking, the unit will probably be dismantled in a few weeks, a Lincoln spokeswoman said. Given sufficient promotion and support from bank personnel, Lincoln believes such terminals will receive a favorable customer response.

The terminal, manufactured by Datatrol, looks somewhat like a 10-key calculator and is similar to that used by Lincoln tellers in verifying balances and other account information for depositors, she noted.

By following the posted instructions and typing in five introductory digits, the seven-digit account number and a four-digit code number which protects the account from access by anyone else, a Lincoln checking customer can obtain complete balance information on the checking, savings or overdraft (cash reserve) portions of his account.

During the first 2-1/2 weeks of use, a receptionist was on duty at the terminal to instruct customers in its use. During that period, the daily usage was about 30 customers, she stated.

Questionnaires netted favorable reaction to the terminal, as did personal interviews, she added.

Security, Privacy Considerations

Questioned about security and privacy, the spokeswoman said that while customers were allowed to believe "code numbers" were issued randomly, in actuality, the number consisted of the second, fourth and sum of the fifth and sixth digits of the seven-digit account number.

"We were fearful some customers might attempt to access information to which they were not entitled; that was the reason for the code number in the first place," she said.

While emphasizing the positive reaction of customers and the success of the project, the spokeswoman added that the addition of a customer terminal in each bank branch "would be an expensive procedure requiring careful planning."

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Labor Department Forecasts

DP Employment Prospects to Grow 30% in Next Decade

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – Employment prospects in the data processing field will continue to grow through the 1980s, according to a recent report from the U.S. Department of Labor.

Job openings in the computer field will show an overall growth of 30.4% in the next decade, the report predicted.

The continuing growth in employment demand can be attributed to four major factors, the report said:

- Growth in the number and types of computers and peripheral equipment manufactured.
- An increase in the number and types of organizations using computers or computer services.
- Continued development of new computer uses.
- Increasing emphasis on computers as tools for management information.

A recent Bureau of Labor Statistics (BLS) study estimated approximately 765,000 systems analysts, programmers, computer operators and DP equipment repairmen were employed in 1970 – a rise of several hundred percent since 1960.

While growth will continue, it will be slower than during the past decade. A total of 997,600 jobs will be available in 1980, an increase of only 30%.

The greatest increase will be in the area of repairmen, whose ranks will increase 101.7%. While this represents a large increase in jobs, the actual number of openings will be low, totaling only 72,000 in 1980 compared with 36,000 in 1970.

The BLS report predicted a 60.7% increase in systems analysts' jobs and a 41.6% increase in programmer openings, while 1980 requirements for operators was projected at 275,000, an 83.3% increase.

Employment of keypunch operators is expected to decline to 235,000 in 1980 from 300,000 in 1970.

The 22% drop will reflect a reversal of the employment trend which has prevailed for this employment category during the past two decades, the report said.

Changes in Job Functions

An increasing demand by computer users for sophisticated systems able to do a variety of new things will force changes in the job functions of computer workers, the report said.

"Generally, these changes will take the form of increasingly complex tasks for higher level computer occupations and an erosion of the duties of some lower level workers," the BLS report stated.

The need for improved programming productivity, the growing use of software packages and the necessity for programmers to know more than one computer language will have the effect of upgrading some of the programmers' duties, the report specified. At the same time, some of the more routine work of programmers may be done by computer operating personnel, the report said.

"Finally, the job duties of computer workers also are expected to change because the cost of computer manpower is a major part of the overall cost of computer users, and computer manufacturers have a strong incentive to cut the manpower needed to run their equipment by building into it functions now done by computer personnel," the report stated.

Centralized Facility Under Investigation In Nova Scotia Study

HALIFAX, Nova Scotia – The possibility of a central computer center to serve the DP needs of all provincial municipalities in Nova Scotia is under consideration.

Currently, Halifax has the only computer system in the province for municipal operations. The city leases an NCR Century 101, which it operates in batch mode.

The provincial government, located in Halifax, also operates a computer but does not provide services to outsiders.

Nova Scotia has 65 municipalities, of which about 10 are large enough to warrant use of a computer system.

Feasibility of Alternatives Studied

A study has been under way for the past eight months to examine the feasibility and possible alternatives for such a central facility, according to Charles Smith, DP manager for the city of Halifax.

Under investigation is the possible use of larger equipment, a network of minicomputers or the utilization of someone else's equipment, he said.

"Large equipment would probably be in the area of a Xerox 560 setup," Smith said, "or we could buy time on the provincial government's IBM 370/145 or from a local university."

Either of these potential "service bureaus" probably has sufficient power to handle the extra load, he said, but, in view of the demand for on-line capability, might have to add some power.

The third alternative, Smith said, would be a network of minicomputers. He envisioned the minis located at a central site with one mini, for example, working on taxes, another on social services, etc. Each municipality would then have a concentrator feeding into the network.

While the study is still in the initial stages, Smith said the cost of any central facility would probably be shared among the user municipalities based on usage, plus possibly a standard charge to cover development costs.

"Everyone would benefit from a centralized operation," Smith said, "particularly if operations in the various municipalities were standardized."

This, he said, would benefit the provincial government in particular, since all municipal bookkeeping reports are eventually sent there.

"If the input for their system arrived in a standardized format, they would be ahead of the game," Smith said.

Systems network adaptability

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This scheme gives users a complete, cost-effective data capture network for distributive data processing and communications.



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International Harvester found more . . .

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Editorial

Your Serve, Telenet

The advent of a packet-switched communications service by Telenet Communications Corp. [CW, Aug. 27] marks the first commercial offering of a value-added network. But it also makes users wonder about the benefits.

The basic concepts were spawned by the Department of Defense Arpa network, and this type of network is now also operating in several European and Asian countries. But most of the existing nets are operated by government and/or research agencies serving mostly the same type of noncommercial users.

The Telenet service seeks to transfer the promised benefits of packet-switched networks to business users. One of the primary selling points is the idea that the user pays only for the amount of data actually transmitted (in addition to certain fixed monthly charges).

Another less tangible benefit is the promised more efficient utilization of communications links. The packet-switching people believe their transmission methods, which restructure the data into packets, are more efficient than conventional transmission modes.

What all this means to the average data communications user is still highly problematical. It is somewhat disconcerting that the first Telenet user turned out to be a time-sharing vendor with a high-volume data network.

While this type of "user" certainly is among the most innovative, the needs of a time-sharing vendor bear little resemblance to a company that operates a nationwide network for its in-house data communications needs.

Another yet-unanswered question relates to the benefits of packet-switched services for the smaller, low-volume data user. This is the user who may want control over his own DP equipment and lines, but does not have the volume to justify the operation of a private network.

Telenet now provides the opportunity for users to weigh these and other trade-offs. Unlike other new carriers, Telenet seems to have the blessing of AT&T, on which it must rely for most of its lines.

Whether this Bell cooperation will change if Telenet proves to be a popular answer to current data communications problems remains to be seen.

But, for now, the ball is in Telenet's court. If the company can sell users on its packet-switched service benefits, the demand for facilities might well exceed Telenet's growth projections.

Data communications users are a cautious and skeptical lot. They will be watching this venture with interest.



'Your Honor, Our Software Agreement With Catamore Was Too Vague to Be Enforceable — How Can You Give Anybody the Moon?'

Letters to the Editor

Wrong Comparison Chosen To Illustrate Discrimination

Joscph T. Rigo (Aug. 27) has chosen the wrong comparison to illustrate discrimination or non-discrimination in DP based on sex.

Rather than comparing women who stay on the job with men who stay on the job, he should compare women who "drop out of the labor force for 15 or 20 years to raise children" with men who "drop out of the labor force for 15 or 20 years to raise children."

Sauce for the gander is seldom sauce for the goose and, anyhow, how can he bc so dense as to believe that raising children is not labor?

Sally F. Dennis
Montrose, N.Y.

Names Cause Problems, Too

In regard to Alan Taylor's column, "Why Does BankAmericard Still Regard Us as Numbers" [CW, Aug. 20], I completely agree the system does not seem to have enough checks, but I disagree with his solution of using names.

An account card is a necessity to keep account transactions separated. The account number, with proper checks against it, will help keep the accounts straight.

If account names were used on the card, even with a check digit or character, you would easlly run into problems because many people have the same name.

If account names are used without a card, you have problems like I have had when I received bills for Ronnie Gardner, Ramond Gardncr, Ronald Gardncr and Rodney Garner. You may also have problems if your initials and last name are the same as somcone else's.

Another case is when a name can be spelled different ways by different people, such as my wife's. The name "Sheryl" can also be spelled "Cheryl," which might cause someone else to be billed. My wife's name can be signed Mrs. Rodney Gardner, Mrs. R.T. Gardner, Mrs. Rodney T. Gardner, Mrs. Sheryl Kay Gardner, Mrs. Sheryl Stevenson Gardner or Sheryl K. Gardner.

Rodney T. Gardner
Winnsboro, S.C.

Desk Reference Aid to DPers

I follow with interest most of the trade publications involving the computer and communications industry. None of the publications have informed their readers of the availability of a very important desk reference work on the computer industry.

The document I am referring to is the record of hearings held before the Subcommittee on Antitrust and Monopoly of the Committee of the Judiciary U.S. Senate, 93rd Congress, on S-1167, the Industrial Reorganization Act.

Part VII, entitled "The Computer Industry" covers hearings dated July 23-26, 1974.

The report contains full transcripts of the testimony submitted to the committee as well as exhibits which would be of interest to everyone concerned with the computer and DP industry. For example: International Data Corp. submitted extensive data as to the size and characteristics of the marketplace, various divestiture plans prepared by Control Data Corp. in the course of its litigation against IBM, thc full text of the original complaint in the U.S. vs. IBM antitrust trial, the full text of Judge Christensen's decision in Telex vs. IBM, the full text of the judge's decisions in Honeywell vs. Sperry Rand, as well as the testimony of a variety of other industry observers and experts.

Copies of the record of these important hearings are availablc for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The price is $9.55 per copy.

A.G.W. Biddle
President
Computer Industry Association
Rosslyn, Va.

Itemized Lists Third Alternative

In considering thc qucstion of price marking in supermarkets, have any of the systems in use or under development considered a third alternative – itemized lists? It seems as though it would add minimal cost to the system to provide customers with an itemized list of purchases by brand name, item, size and cost.

On the other hand, it would provide the customer with an advantage in comparing costs, since corresponding purchases could be compared on the basis of factual data.

R.J. Gartner
San Jose, Calif.

No Price Marking Back Then

When I was young, my mother would take me to the grocery store. She would tell the clerk, item by item, what she wanted and the clerk would get each item from behind the counter.

When he had gathered all of the items, he would write the price of each on a sack, add them manually and tell my mother the total.

None of the items was price marked, and no one objected. What's all the fuss about?

Sydney B. Self Jr.
Waltham, Mass.

(Other letters on Page 22.)

Back to Civilization

The scientific and engineering user community, especially that part which still requires or at least enthuses over the giant number crunchers, is beginning to talk again about Old Seymour, the last of the Neanderthals. Soon to be extinct, like the sabertooth and the cave bear, Brother Cray has awakened from enforced hibernation and is stirring rural Wisconsin to frenzied activity. Indeed, conversation about the Cray One is supplementing gossip about new dairy cow productivity records in Chippewa Falls, the metropolis of the region. I've been reliably informed that the proposed relocation of the giant-computer activity from that smog-bound urban center to nearby Elk Mound (population 471) was canceled by The Hero Of Livermore when he found out the city fathers were planning to pave the cross street.

Joking aside – and I really do think his projects have been hurt by his desire to remain a rural recluse – Cray has been responsible for the design and the partial construction of the majority of giant machines in place around the world. In white hat applications like numcrical meteorology, in darkest nuclear weapons country, his Control Data offspring are dominant. I'm genuinely delighted to see his group surface again, even if still in eremitic Cheppewa Falls.

It is the more disappointing, therefore, to see Cray, like Amdahl-san, eschewing architectural novelty and wild new Elsi [extremely large-scale integration] components. The great thing about Stretch, the IBM venture into supercomputers of 15 years ago, was that the designers tried far-out transistors, the look-ahead concept, freon cooling and early overseas installation, all in one giant gamble.

"Ah," you may say, "but Cray and Amdahl are poor old codgers, not rich like IBM!" In a sense that is true, of course: even with money from Livermore and from Fujitsu respectively, neither man has had a bottomless purse to dip into. Neither did Dunwell and the other Stretch boys, though, even within IBM, and it seems to me that what Cray should be offering Livermore and other prospective customers, and Amdahl should be offering the Japanese, is far-out architecture, not economy.

The American taxpayer, I believe, would in the very long run get a reasonable return on his involuntary investment via the old Atomic Energy Commission and Sid Fernbach's Livermore shop, if it produced crazy new stuff like a hopped-up associativc processor or the first hologram memory, rather than dull software-conserving extensions of current very big machines.

The giant-computer museum at Livermore really ought to be shut down, or cut back to a couple of megaminis. Its ultimate product, deadlier nuclear weapons, and its methodology, the Octupus time-wasting system, are as obsolete as the high-speed line printer and the hand trucks of paper output per hour that they encouraged. Only if real innovation, another genuine *stretch* of number-cruncher architecture or componentry, could be attempted, should the enormous wastefulness of that shop be continued.

Seymour, we need you! But we need you to try weirder systems than the Cray One. Move to Cambridge or California, Old Cave Bear – build us a wild one!



Herb Grosch

For Last Word on Contracts

Technician Must Play Two Roles in Vendor Dealings

Part 1 of this series on users' legal rights [CW, July 30] discussed the circumstances under which computer contracts could be set aside, thus lifting the restrictions to the rights of a computer user which are included in most preprinted, vendor-created contracts.

The Taylor Report
By
Alan Taylor, CDP



These circumstances included when the contract was obtained by giving the user incorrect information; when essential information was omitted; there was a lack of intention to be bound by the contract terms; and/or there was a failure to warn the unknowing customer of the dangers potentially involved in the use of the vendor's system.

Part 2 [CW, Aug. 13] translated these legal concepts into the computer procurement environment, dealing with the position during the proposal, implementation and use stages.

Part 3 [CW, Aug. 27] dealt with the types of remedies that are available, including benefit of the bargain, being made whole and punitive damages.

Computers are not desirable in themselves. No one hangs them on art gallery walls or buys them for themselves. Few manufacturers sell computers for themselves. Generally, computers are bought because they are expected to provide results in a foreseen way at a forseen cost.

Getting results from a computer involves many things. It involves the nature of the apparent results themselves, of course. Are they really accurate? Are they really reliable? Do they turn out on time? Is the information provided as useful as it was originally said it would be?

It also involves the cost of the results. If a computer vendor gets a computer order on the basis that the results will be obtained with a staff of one operator, and it takes the user three systems analysts and four operators to obtain these results, then the original representations have not been kept, for the representations considered the costs as well as the performance.

Yet again, vendor representations often involve the timing of thc results. If they were supposcd to bccome available in January, but did not become available until June, that again would not be keeping the bargain.

Real-World Compromises

Normally, however, a user is more interested in getting some of the results or in getting them shortly after they were originally due, than in giving up the project. From a legal point of view, indeed, it could well be that going on with the project despite some apparent failures to meet promises is obligatory so as to minimize any damages the early failures had already resulted in.

So, there is no reason the user technical staff should not plan various compromises to meet the contingencies that can occur, even though these may involve accepting some changes in the original proposal.

User Responsibility

What could be wrong, however, is to accept total user responsibilities for these changes, when in fact they result from vendor problcms. A user technician in being authorized to get a system implemented, is normally not authorized to change the terms of a contract. And there is no reason for him to be so authorized. A certain amount of humility is called for when dealing with vendor personnel – one should not upgrade ones technical authority beyond that which is needed for the job in hand – the implementation of the system.

Similarly, when the system is tested and accepted for use, an in-house technician should ensure the vendor takes his full share of the responsibility.

The tests the vendor provides are all well and good – but do they really show the system is going to remain reliable year in and year out? I doubt it.

So the user technician should let the vendor personnel say the system is ready for live use, rather than assume he himself can really determine this.

Naturally, once the vendor has said it is ready, the user can assume it is and work on that assumption – but it is still better to let the vendor sign off first.

Don't Dump Proposal

Outside of these purely defensive measures, a user should not let the vendor forget that his contractual terms, no matter how stringent, can be challenged, unless he took a great deal of care during the proposal period to give information and to provide warnings of dangers.

Any argument that the vendor proposal, for instance, is to be disregarded because of some term disowning it in the written contract can be countered from legal as well as from cthical standards. IF the proposal statement now appears to be inaccurate, this directly raises the question as to whether, when the proposal was made, the true facts were known and concealed. If they were, false statements were apparently included in the proposal. So the whole written contract may well be invalid, including the clause disowning the proposal.

Ignorance No Excuse

Even if the proposal statement was not originally known to be incorrect, the vendor is not necessarily home scot-free. If the computer user relied upon something which by its nature he can see was only a salesman's estimate such as a forecast of the amount of business the user would do when the system was installed, the vendor will not be saddled with responsibility for that. However, if the proposal statement dealt with something that was knowable, such as timings for a particular run, thcn thc fact the vendor actually didn't know the timings does not shield him from the consequences of providng incorrect estimates under the guise of providing actual timings.

In brief, the user technician has to wear two hats and to keep them distinct in his mind. As the person responsible to his own management of implementing the system, hc must deal with reality, accept and minimize delays, costs, overruns, etc. In this capacity, he should deal with thc vendor simply as an implementor of a contract entered into by his employer, not by himself.

Then, when acting as a contract negotiator or advisor to his firm's negotiators, he should expect to rely upon the proposal and other material, at least until the vendor tries to claim it wasn't included in the contract.

Then he should ask the vendor to explain why his firm should bc restricted by the terms of the contract when the order was apparently obtained through the use of the inaccurate proposal.

Showing an understanding of the duties of the vendor to act responsibly and not to shield himself under legal doctrines of unenforceable agreements will perhaps surprise the vendor salesman.

It will, however, prevent a situation from deteriorating and can stop that fecling of hopelessness that comes to someone who reads those contract forms and thinks they are the last word.

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Software Protection Seekers Need Sound Perspective

By Roy N. Freed
Special to Computerworld

Many computer people and lawyers make the common mistake of trying to examine the question of software protection in isolation, separate and apart from other legal considerations. In doing so, they run the serious risk of proposing solutions that themselves introduce adverse legal consequences. Let me develop this point concretely.

Many people insist that statutory copyright is the proper – if not the ideal – measure for protecting software programs from unauthorized use. However, that protection reposes in the "writings" that reflect the program steps, such as the coding listings, and possibly also the magnetic tapes and other computer media for generating signals reflecting the coding to the computer, if and when courts hold those media to be "writings."

It does not repose in the process or series of steps themselves. This is a very important distinction because software program suppliers are not content to make their money charging for copies of the copyrighted work, as traditional publishers are.

Instead, they try to market their wares by pricing separately each program per CPU and by trying to restrict disclosure of the nature of licensed programs to others.

Incidentally, the first of these marketing tactics requires, for its legal foundation, that the supplier be able to control the use of the media, which copyright ownership alone does not support. The latter effort might be fundamentally inconsistent with statutory copyright.

Supplier Invites Adversity

With the statutory copyright approach, the supplier invites a number of adverse legal consequences for itself and its customers. The legal arrangement focuses on the media or the documentation or both.

It is thus very similar to book publishing and identical to the distribution of motion picture printers, which involves the leasing of copyrighted items. As a result, the transactions between supplier and user might become subject to sales and use taxes applicable to the charges.

Similarly, the computer media and documentation might be treated as tangible personal property subject to annual taxes, where they are in effect, on that type of property. In some states those taxes are imposed at high rates.

If the supplier purports to sell the software programs, which is rare, then the tangible personal property taxes fall on the customer.

More normally, where suppliers purport to have ownership of the computer media and related items, they are exposed to the tangible personal property taxes. That financial burden can be considerable.

Many suppliers which rely on retained ownership of the computer media as an adjunct to statutory copyright also might expose themselves to the need to qualify to do business in the states in which their licensees operate.

This corporate qualification involves expense and administrative burdens that would be preferable to avoid. The licensor of software that asserts ownership of the computer media might be in the same situation, for these tax purposes, as a lessor of computer equipment.

This brief review indicates why it is advisable to devise a software program marketing strategy from a sound legal perspective. Alternative means for legal protection for software programs well might be available that have protective qualities at least equal to those of statutory copyright but escape some, if not all, of the taxes described above.

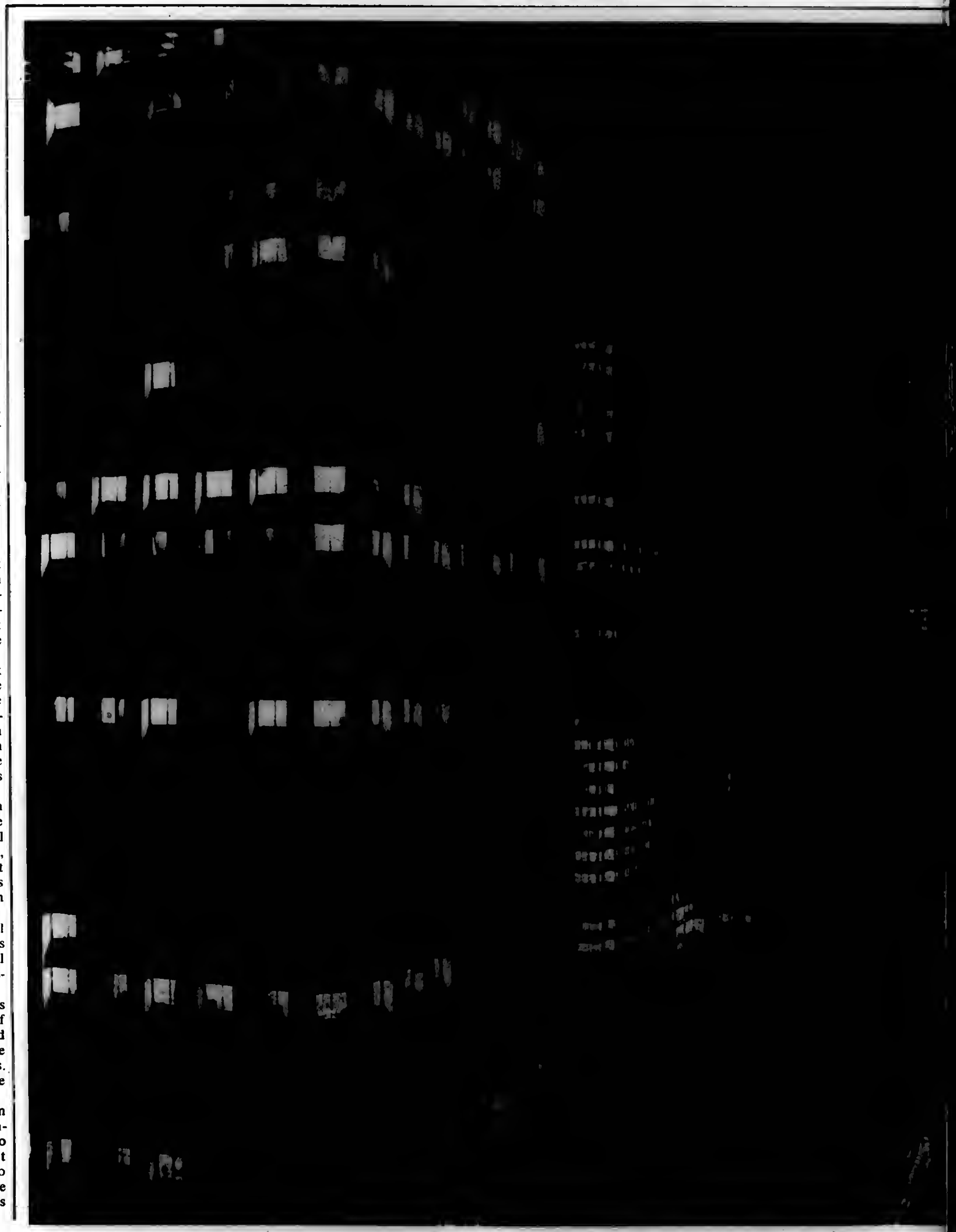
From a Legal Viewpoint

The trade secret route to protection is a good example. It is based on the position that the "software program" is a process for processing information. The customer is licensed to practice that process.

Rather than being the very heart of the transaction, the computer media and documentation can be deemed to be merely means for communicating the nature of the processes involved, equivalent to the technical manual normally furnished the licensee of a manufacturing process.

If that approach can be established effectively, the taxes and corporate qualification burden discussed above could be avoided.

It is important to recognize that some apparently simple transactions in the computer industry can run the risk of major economic and legal impacts. All transactions deserve to be examined carefully early in the game. Many adverse consequences can be avoided by foresight.



Lessons From Iconoclast and Smoothdog

Choice of Efficiency or Maintainability Subjective One

By Miles Benson
Special to Computerworld

Which is more important, efficiency or maintainability?

That's a pretty interesting computing question.

The Sociology of Computing

It turns our to be one of those dividing-line things, like the Vietnamese war, where people tend to choose up sides, and get locked in, and quit thinking about the underlying issues any more. Advocacy, not reason, results.

You may not recognize it as a fundamental question, the way I've asked it. Let me ask it some other ways, then:

Which is better, Assembler language code or high-level language code?

Which is better, special-purpose code or general-purpose code?

Which is better, clever code or readable code?

Beginning to get an image? There's Byron Inconoclast, speed-demon coder, who can spout machine language instructions at the drop of a core dump, solve all the tough problems in your shop including some you didn't want solved, work hours so odd no one is sure he's ever there – except for the spoor and working programs he leaves behind – and give everyone else the feeling they're inferior to him in some way they don't understand.

And then there's Samuel Smoothdog, documentor extraordinaire, who writes programs which are so readable that he had one published in the *Saturday Evening Post*, has memorized the programming standards manual and quotes it at the drop of a design review, wears suits imported from IBM-Poughkeepsie and gives everyone else the feeling that he's going to be their boss some day regardless of who's superior.

Back Up a Little

Now that we're on the same wave length, let's back up a little ways. This is a "Projects Which Failed" story, right?

Well, considering that probably most computing shops have a zoo full of Byron Iconoclasts and Samual Smoothdogs (and, what's even more interesting, probably *need* them both!), where's the "Project Which Failed"?

Well, try to picture the worst possible environment for Byron Iconoclast and Samuel Smoothdog. Got the picture yet? Assign them to the same (gasp – now you've got it!) project! From here on out, the story pretty well writes itself.

Clever Devil Toy Co. does more computing work than one might think. Besides the billing and payroll and all that jazz, it has some market analysis programs and some design code and even a simulation or two. And enough smarts that it occasionally bids on, and wins, a software contract. It helps balance out the industry's cyclic loading of people and computers, top-level management says.

All of that makes both Byron Iconoclast and Samuel Smoothdog, Clever Devil employees, very happy. It gives them some interesting projects to get involved in.

One of those projects, though, was an unmitigated disaster. It was a hardware analysis program, subcontracted to Clever Devil by a leading auto manufacturer, General MPG, which had more computers than it had people to configure them.

The purpose of the project was to analyze the General MPG shop, both hardware and software, for effectiveness by inserting software probes at various sensitive points and measuring microengstroms and nanocuries and drawing some automated graphic pictures of who was doing what to whom within the system.

Tricky stuff, but important, and worthwhile, and a veritable salivation stimulator for the Byron Iconoclasts of the world.

Off Went Byron

Well, off to work went Byron. I mean that literally. It's not just that Byron flew off to Battle Creek to study General MPG's installation first hand. It's more that he did his analysis during production time at the General MPG computer consoles, his sleeping in the General MPG staff meetings, his coding in a previously graffiti-free area of the General MPG Executive Person's Room – and he even tried to enter the General MPG supersancrosanct Advanced Styling offices in order to use its graphics consoles for some system modification work.

At any rate, what happened next was quite predictable. To

(Continued on Page 22)

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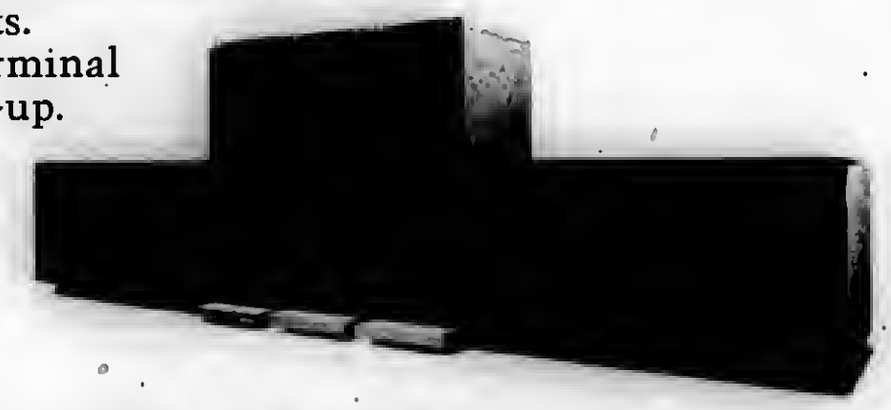
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Efficiency or Maintainability? Choice a Subjective One

(Continued from Page 19)

put it automotively, Byron was recalled. General MPG had had it up to its hood ornaments with Byron's tie-dyed tee shirts, open-toed tennyrunners and Adam's apple-length hair (front and back).

Clever Devil was told to either unplug Iconoclast or unplug the contract. It made the obvious choice.

The Plot Sickens

However, and here is where the plot sickens, Clever Devil was in real manpower trouble. It was in the midst of simulation and market research studies for a possible pre-Christmas announcement of a toy Soyuz-Apollo spaceship kit, and every person on its programming staff was already lashed fast to the coding pads. Byron's return was welcome enough; but how do we replace him back at Battle Creek?

You, of course, are way ahead of me in the plot line. You know that Clever Devil is going to pick, by some undefinable process, Samuel Smoothdog to replace Byron, right?

And off went Samuel into the halls of General MPG.

There were some good things and some bad things about sending Samuel to Battle Creek. The good things were that they loved him there. Samuel was to General MPG as the installation of a Pepsi-Cola sign would be to a spot 800 miles northeast of Timbuktu.

Samuel did his analysis at the desk provided for him by General MPG, his thinking in the General MPG staff meeting, his coding on official General MPG coding pads, and he did right by both the General MPG Executive Person's Room and the General MPG Advance Styling offices. In short, he was, in a personal sense, a Computing Godsend.

But there were also the bad things. I don't know how to tell you this, but you can't ask a high-level language man to tinker with an operating system. You can't ask a general-purpose man to service nanosecond-dependent interrupts. You can't ask a readability man to write intricate solutions to intricate problems.

To be brief, Samuel stubbed his Florsheim brogans on the task's technology. It was too much for him, and the standards manual didn't show him a way out.

To make matters worse, by the time Clever Devil, General MPG and Samuel Smoothdog (in that order) realized that fact, it was nearly too late. Sam had destroyed all of Byron's original efforts as unmaintainable, ungeneral-purpose and unreadable. When the second recall occurred, Clever Devil was really right back at ground zero.

And it had proven the old adage – you can't make a sow's ear out of a silk purse.

But it hadn't fulfilled the General MPG contract.

It was lucky for Clever Devil that hardware analysis was what it had contracted to do. I mean, if you fail totally, and do nothing, then you haven't hurt the company you failed to satisfy except in the pocketbook. Its hardware runs just as it did before, and its software is uncontaminated by any changes (fortunately, Samuel Smoothdog's revisions were well-documented and easy to remove).

That hunk of philosophy didn't really help General MPG, or Clever Devil, but it was all they had.

The contract was defaulted, and the project failed.

Now, I'm going to give you a little quiz:

Which is more important, efficiency or maintainability?

Which is better, Assembler code or high-level language code?

Which is better, special-purpose code or general-purpose code?

Which is better, clever code or readable code?

You have 60 seconds to answer. Oh, and before you start, these are not yes or no questions. I want an essay response.

Start!

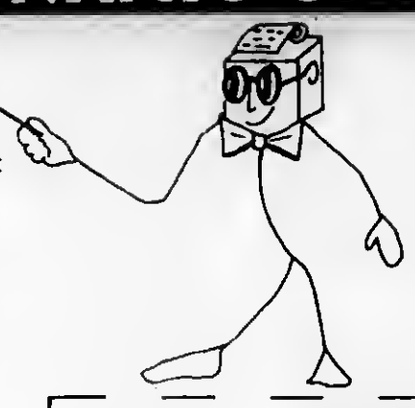
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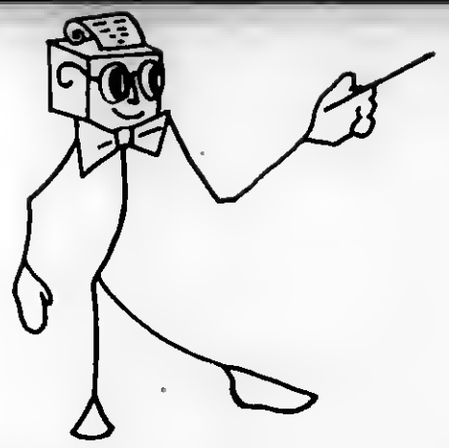
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Letters to the Editor

Certification of DPers Putting Cart Before Horse

The nonproductive arguments over certifying or licensing so-called "data processing professionals" have wasted enough of *Computerworld*'s valuable space.

I circulate quite widely among the working computer community and I've never had a discussion on this topic with an individual who believed such certification makes any sense at this point. And this includes many holders of the Certificate in Data Processing who uniformly have gotten certified just in case it might mean something to someone else.

It is putting the cart several miles in front of the horse to play at certifying before knowing such a thing as a "data processing professional" exists.

It would surely be possible to certify that individuals are "Fortran Programmers," "Cobol Programmers," "hardware monitor specialists" and so forth, but to insist we must be "professionals" insults those among us who think we are tradesmen, artisans or hourly laborers.

If skill tests existed covering a dozen or more of the crafts needed to use real computers in productive environments, then (perhaps) a practitioner who had passed all of the individual tests might qualify to be called something like a "master" of the computing trades. And after several hundred had qualified as "masters," they could decide who would have to bear the label of "professional."

Please, almighty appointive bodies, get to something worthwhile – or at least to something that won't distract the people at work. The issue of the number of angels that can stand on the head of a pin is still open for resolution.

Michael F. Morris
Falls Church, Va.

Mildred the Mugger Lauded

Joseph T. Rigo's account of "Mildred the Mugger" and her professionalism [CW, Aug. 20] was brilliant! Not only that, it was beautifully written.

Why doesn't *Computerworld* get Rigo to quit hiding his light under a bush and become a regular columnist for CW?

Laurence F. Wygant
Chicago, Ill.

SOFTWARE&SERVICES

T/S Service Keeps Containerized Shipments Moving

NEW YORK – Shipping Intelligence, Inc. has a complex function: keeping track of 100,000 shipping containers a year. It pinpoints the location, contents and destination of any container or traces a container's movements during past voyages.

Before containerization, shipping companies tracked ship voyages; now they track fleets of containers. New logistical problems presented by container shipping have resulted in sophisticated control systems that can be best managed by computers.

Shipping Intelligence, founded 10 years ago, provides a variety of management programs tailored to the needs of the shipping industry. Its president, Sydney Pt Levine, is a computer consultant specializing in the marine industry.

The economics of containerization makes it important to know the status of every container used by a shipping company. Because all shipping companies lease all or part of their containers, the most effective container control system is one which is able to identify how many containers are not being utilized.

"If we can help a shipping company reduce its container fleet by 100 unnecessary containers, we can save it at least $73,000 a year in rental and storage costs." Levine said.

Used in T/S System

The container control program was designed for use in a time-sharing system linked to a data base maintained on the National CSS, Inc. network. The nature of pier operations makes time-sharing the most cost-effective system for the job, Levine said.

One customer is Northeast Marine Terminal Company, Inc., a multiuse terminal in Brooklyn, N. Y. serving both conventional and container ships.

Despite its special requirements, containerization has proved a boon to the cargo freight industry and its customers.

Containerization has speeded up the process at every stage and reduced costs. The combination of container shipping and computer controls now allows a ship to reach port, unload and leave with a new load the same day. Cargo delivery is expedited in hours rather than days. Labor costs are minimized all along the way. Steamship lines get more productivity out of each ship and manufacturers can ship goods at a lower cost and with greater speed and security than before.

The terminal has the responsibility of accounting for all containers and for providing the necessary documents to move cargo on and off the ship to consignees.

One test of the computer system comes on the day a ship arrives. Ship cargo information has preceded it from each port, and a computer printout is available at the pier before the ship docks. The shipping documents are arranged in a format that can be easily used by terminal personnel.

Levine believes an important asset of this program is its usefulness to non-technical workers. "After all, dockworkers are the people who must supply the computer with accurate information and then use the reports the computer can produce," he said. "So we keep our program as close to the traditional methods of recording shipping material as possible."

With on-line access to this data, Northeast Marine can give its customers a delivery status report and know when an empty container returns to the pier after delivery and when the same empty container is being loaded for shipment overseas.

Container control must go further than normal inventory systems, Levine said, explaining, "In general when an item leaves inventory, it never returns. With container inventory, each particular container becomes available many times in its economic life."

The inquiry procedure also enables the terminal to trace missing containers over several months and voyages.

CPEUG Meeting for Novices, Experts

By Don Leavitt
Of the CW Staff

OKLAHOMA CITY, Okla. – The welcome mat is out again at one of the national gatherings of people interested in measurement and evaluation of their DP operations.

The Computer Performance Evaluation Users Group (CPEUG) has scheduled its 1975 meeting for Sept. 23-26 at the Holiday Inn here, according to CPEUG chairman William LeTendre, who works at the U.S. Air Force's Electronic Systems Division.

Once a small Air Force gathering of technicians interested in simulation of computer systems, CPEUG has long been open to all government personnel interested in optimizing DP operations using any of the available tools and techniques. In the past year or two, the group has welcomed participants from the private sector as well.

This year's session will include both formal presentations of results achieved – with a variety of hardware configurations – by the people who have conducted computer performance evaluation (CPE) projects, theoretical approaches to unsolved problems and workshops for those who have only recently become aware of CPE.

Informal discussion groups, formed at the conference to cover problem areas of interest to a number of attendees, will be on the schedule Wednesday and Thursday afternoon, Sept. 24 and 25, running concurrently with vendor presentations of hardward monitors and simulation packages.

Doubled Up

Concurrent technical sessions are also scheduled for Tuesday afternoon and Thursday morning, according to program chairman Dennis Gilbert, a technician with Fedsim. This year's schedule had to be doubled up, he said, "because there are just too many good papers to cover consecutively in the three and a half days of the conference."

Copies of papers presented at this year's meeting and a number of those given at the two previous CPEUG sessions will be included in the proceedings available at the registration desk, Gilbert said. Total cost of registration and proceedings is $20, he added.

In order to get the conference started promptly on Tuesday, Gilbert has scheduled an early registration and "get-acquainted" session on Monday evening. All sessions will be completed by noon on Friday, the 26th, to allow plenty of time to get home for the weekend, he noted.

LeTendre is at Hanscom Air Force Base, Bedford, Mass. 01731: Gilbert is at HQ, USAF, Fedsim, Washington, D.C., 20330. Each said they would welcome inquiries, but added the best way to see what CPEUG is all about is to join them here later this month.

'Ramis' Update Cuts Resources Used, Speeds I/O

PRINCETON, N.J. – Release 5.4.5 of Ramis, the data base management/report system from Mathematica, Inc., contains nine major improvements and "numerous" minor additions and changes from IBM OS, VS, VM and TSO installations and users on the National CSS network, according to the vendor.

A basic change in the report processor reduces the time needed to prepare reports. In addition, the user now has control over the amount of working storage allocated to report preparation, allowing trade-offs between production and CPU time and use of the storage resource.

A change in the way Ramis handles networking of files has resulted in decreases of processing times of 2-to-1, Mathematica claimed. Again, the working storage for processing of pointers is now controlled dynamically by the user.

"Another increment of efficiency" results, he said, from Mathematica's reprogramming of Ramis' procedural computation facility. The rework in this area reduces the time required to perform calculations, enhancements therefore cover output, input and internal processing.

Various improved functional capabilities have been added. With the financial planning subsystem, for example, a user can operate from a read-only disk, which protects the data even when several people are accessing it simultaneously.

Service procedures perform functions such as listing names of cataloged procedures, listing them after deletion of an unwanted procedure, listing a file dictionary or rebuilding the file of cataloged procedures to conserve space.

The basic Ramis system can be leased for $840/mo or acquired under license for $28,000 plus maintenance from Princeton Station Office Park, 08540.

Library Adapted To Xerox Sites

HOUSTON – Even though users of Xerox computer systems are disappointed by the company's announced plans for software support in the future [CW, Sept. 3], they may find solutions from independent software houses.

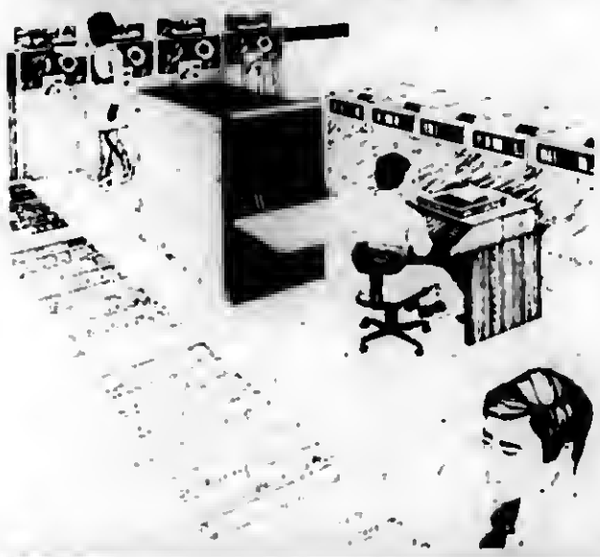
International Mathematical & Statistical Libraries, Inc. (IMSL), for example, has just announced versions of its Fortran subroutine libraries for both the Sigma series (modes 6, 7, 9 and 11) and the newer 560 CPU from Xerox. (A library for the Digital Equipment Corp. Decsystem-10 was introduced at the same time. the vendor noted.)

In its press release, IMSL met the situation head-on, albeit redundantly: "In spite of the recent Xerox announcement, IMSL has decided to continue to support the Xerox computer users due to the high degree of interest in a Xerox library before and subsequent to the Xerox announcement."

With the additions, the IMSL libraries are now available for Fortran users working with equipment from six mainframe vendors.

The library is available for $960/year for universities and $1,200/year for other installations from IMSL at the GND Building, 750 Bellaire Blvd., 77036.

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Purchase Orders Managed

NEW YORK – IBM 360 and 370 users operating under OS/VS or Univac Series 70 users under TDOS can perform many of the repetitive non-analytical tasks associated with purchase order placement with the Automated Purchasing System (APS 11) from Decision Concepts, Inc.

The system can generate purchase orders as requested whenever the vendor and price of the desired items can be determined from a "presourced" parts file. Alternatively, purchase orders can be generated based on analysis of purchasing activity.

A third option permits generation of purchase orders – without user supervision of each order – on low dollar-value items, the vendor said. When buyer action is required, APS 11 prepares documentation containing recent procurement activity to aid in the purchasing decision.

The system supports retrieval of purchasing history, quotes and outstanding orders and requisitions. It contains an integrated receiving module to update the open order file and includes interfaces with both accounts payable and inventory systems.

Reports from the system include a purchase order/purchase requisition register, input and output audit reports, expediting logs, buyer/vendor analysis and blanket order registers.

Vendor and commodity ranking by dollars placed, a vendor directory and mailing labels are also produced, a spokesman noted.

Written in ANS Cobol, APS 11 has been implemented in 128K bytes in an IBM OS/VS environment on a 370.

The system ranges in price from $50,000 to $75,000 depending on options selected. Decision Concepts is at 280 Park Ave., 10017.

Major System 2000 Enhancement To Include Recovery Facilities

AUSTIN, Texas – Phase I extensions to System 2000's current save/restore and rollforward facilities will be available in Release 2.80, scheduled for delivery during the second quarter of 1976, according to the vendor, MRI Systems Corp.

Features being added to the data base management system are upwardly compatible in the release and will be available to new as well as existing customers.

The extensions include:

- Program-initiated rollback/restart.
- Autorollback/restart.
- Checkpoint/restart.

Program-initiated rollback/restart will allow executing System 2000 natural language, PL/1 message or PL/1 batch programs to terminate, roll back and restart update transactions.

Autorollback/restart will protect System 2000 data bases from user program Abends and OS failures. With this facility, System 2000 will recognize any data base damaged by abnormal system or user program termination and initiate a back-out of the effect of all update transactions in process at the point of failure.

Where Am I?

Checkpoint/restart provides the PL/1 message and batch program user with facilities to capture an image of the data base at any point during a program. The user or the data base administrator (DBA) may roll back to a predefined checkpoint and restart from there, MRI said.

As with save/restore and rollforward, the recovery facilities may be enabled and disabled for each data base, allowing the DBA to limit recovery logging to update sensitive data bases only, such as those supporting on-line data entry systems.

System 2000 is currently operational on IBM 360s and 370s under OS, VS1 and VS2; Univac's 1100 series under Exec 8; and Control Data Corp.'s 6000, Cyber 70 and Cyber 170 series under Scope, Kronos and NOS.

Currently the basic System 2000, of which Release 2.80 will be an update, is available for $30,000.

MRI Systems can be reached through P.O. Box 9968, 78766.

On-Line Programming Supported by 'Taps'

NEW YORK – Users building on-line programs can do their work "largely independent of communications monitor, data base design and terminals used" by using the Terminal Application Processing System (Taps), according to the vendor, American Computer Software Clearinghouse, Inc. (ACSC).

Taps includes routines to handle those functions common to all on-line applications. It also has a data element dictionary which makes data file formats transparent to the user, a simplified macro language, a generalized batch mode on-line simulator and a facility for documentation generation, ACSC said.

Screens in Hours

User experience shows useful and usable CRT screen programs can be created in "a matter of hours" and reach production status on the first application in "approximately one-third the time originally estimated," the vendor claimed.

Taps works under all versions of IBM's CICS and the OS and VS versions of Tcam. The VS versions have been optimized to make most efficient use of the IBM paging algorithms, ACSC said. The "real" versions can reside in 48K bytes of main storage.

The package can be purchased for $25,000 or leased for $750/mo from ACSC at 2 W. 45th St., 10036.

Fortran Extended For DG Nova Users

VANCOUVER, B.C. – The Fortran Extended Subroutine Library from F.E.S.L. provides users of Fortran IV on Data General minis with byte/string handling, arithmetic including double-precision integer support and other operations including a facility the vendor labeled an extensive Cobol-type edit.

Use of the library routines can result in a 7K-byte reduction in program size because of more efficient I/O, the company said.

A permanent license is available for $500 from F.E.S.L. through P.O. Box 48254, Bentall Station, V7X 1A1.

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ASI/INQUIRY has been fully operational for over six months, and is currently installed in multiple sites here and in Europe.

A number of seminars on ASI/INQUIRY will be held in major U. S. cities in the near future. Watch for announcement of the seminar schedule, and plan to attend the one near you. However, if you want to start answering "What if . . . " immediately, call or write today for further information.

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'Hidden' PL/I Option Optimizes I/O, Tests Indicate

Almost by accident, users stumble upon interesting and apparently useful options in their language processors.

In a letter accompanying this article, Souerwine said it "bothered" him that his IBM sales representatives "never mentioned the [Total] option's existence . . . Even after we became aware of [it], we could find very little on it in the IBM-supplied technical information support manuals.

"This experience makes me wonder how many more such enhancements are readily available and easy to use."

By David A. Souerwine
Special to Computerworld

In general, I/O tasks in PL/1 programs are executed by library subroutines called from compiled code. We had heard, however, that the Total option in IBM's PL/1 optimizing compiler can provide in-line code, under certain conditions, to optimize these operations.

Being somewhat skeptical that the option would really impact I/O performance significantly, we devised a test keyed to data sets being accessed or created as consecutive, sequential and buffered. These are the standard default attributed for files declared as either input or output.

Concepts and Techniques

All tests were conducted on an IBM 370 Model 145 running under OS/VS1. To check out input optimization, a file with 50,000 records, 100 bytes each, was created on a 2314 disk drive with a block size of 3500. Both the "Move" mode (data transfer from external storage to the variable named in the read statement) and the "Locate" mode (data transfer from external storage to an input buffer through the use of a based variable) were tested using the input file declared with and without the Total option.

		No Total	Total
Move Mode	Mean	13.03 secs	7.20 secs
	95% Interval	12.16 to 13.90	6.73 to 7.66
Locate Mode	Mean	10.15 secs	5.32 secs
	95% Interval	9.84 to 10.45	4.57 to 6.08

Each of the four combinations was executed eight times, with the mean and 95% confidence interval about the mean being determined for each combination. A program representing the pure overhead resulting from execution of file OPENS, file CLOSES, DO loops, etc. was run eight times, with the mean and confidence interval being determined for these runs as well.

At this point, using the statistical confidence intervals, the longest overhead was subtracted from the fastest execution, and the shortest overhead was subtracted from the slowest execution for each combination. This process yielded a 95% confidence interval with the end points representing the best possible and worst possible execution times for each combination.

The "no Total"/Move mode is at least 100% slower than the Total/Locate mode, and possibly as much as 204.2% slower (mean indicates 144.9% slower). Even disregarding the Locate mode, the no Total/Move mode is at least 58.7% slower than the Total/Move mode and possibly as much as 106.5% slower (mean indicates 81.0% slower).

The remarkable fact is that, for a program using files with the above characteristics, there is no trade-off involved in declaring the file with the Total option. That is, this option is "free" to the programmer and does not necessitate changing any syntax or logic code.

The Total option cannot be specified for Vsam data sets, files reading Optical Mark Read data, or device-associated files. In addition, Total assumes no file attributes will be merged from any I/O. statements or the OPEN statement.

Similar results were obtained in creating a file with 20,000 records, 80 bytes each, on a 2314 disk drive with a block size of 1680. The no Total/Move mode is 150% slower than the Total/Locate mode, on average. The no Total/Move mode is 86.1% slower than the Total/Move mode, on average.

Souerwine is marketing information systems coordinator for the Bausch & Lomb Soflens Division in Rochester, N.Y.

Software House Backs CDC User

PITTSBURGH, Pa. – Users of Control Data Corp. mainframes can enhance the efficiency of some very specialized operations with one package from Cyber Associates, Inc. and improve the handling of one class of business problems with another.

The Program Optimization Package (POP), designed for the hardware capabilities of CDC 6000 series CPUs, consists of a polynomial evaluation routine and a simultaneous equation solver. Cybersort is a high-speed stand-alone or Fortran callable sort program, with report generating facilities.

The Polynomial evaluation routine within POP evaluates the wave front equation in less than 2 μsec/term, the vendor said. The simultaneous equation solver requires no extra buffers and allows unpacked matrices, the spokesman added.

POP is particularly suited for use in all curve-fitting applications, he noted, adding that the routines in the package are available separately; the polynomial routine going for $1,500 and the simultaneous equation solver for $1,425.

Cybersort accumulates user-specified fields, takes subtotals and totals and prints all headings and footings.

The sort program, working in core or from file to file, allows an unlimited number of sort keys and subtotal fields.

This combination sort-report writer is available now for $25,000.

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Keane Observations

'80-Hour Rule' Backs Project Control

By Don Leavitt
Of the CW Staff

WELLESLEY, Mass. – Many DP managers regularly apply the principles of project definition, project responsibility, progress reporting and supervision of changes and trade-offs – but the projects still get in trouble.

This happens, according to a Keane Associates newsletter, because even with fairly well-known guidelines and checklists of key elements within a software project, there are also a number of potential "bull traps."

Concepts and Techniques

At the same time, however, there is a technique of productivity management the editor of *The Consultant* said works for Keane and should work for any software development group. It involves breaking any project into segments that should not require more than 80 hours of work to complete and reporting the status of each segment on a completed or not-completed basis.

Before detailing the "80-hour rule," the newsletter recognized the hazards of the "nonexistent resource" and the verbal "understandings" that aren't understood the same way by all parties involved.

Effectively, resources to continue work on a project are nonexistent if they are unavailable to the project member who needs them. Test time on a computer is one of the best known examples of this situation, when scheduling of the system is out of the hands of the programmer waiting for a test shot.

But having user department personnel unavailable to create test data or to evaluate the results of a test shot – if in either case that support was part of the project plan – is an equally valid example of resources that are effectively nonexistent, Keane said.

It has become almost a commonplace to stress the need for written communication, but the newsletter added another pointer in that respect: reports should be prepared on a regular, continuing basis, even if a form is used and it is an exception report of items that have missed deadline.

On major projects, Keane recommended use of an objective third party who stands apart but maintains good working relationships and communications between the developers and the users.

Even written reports won't always avoid another problem – the subjectivity of project staff personnel in estimating the degree to which their particular assignments have been completed.

The classic approach – though invariably the wrong one, according to Keane – is to measure project progress by yardsticks, such as actual vs. budgeted man-days, or by the subjective best guess of the personnel involved.

These measures are too elastic, Keane said, adding "a much more preferable technique is to remove all doubt from the measurement function by imposing 'all or nothing' rules on it."

The Concepts and Techniques pages are intended to serve as a clearinghouse of ideas to make user programs – and the programmers themselves – more efficient.

Reactions to Souerwine's evaluation of the PL/I feature he "stumbled upon" are welcome, as are descriptions of other ideas readers have found helpful in their own coding efforts.

Contributions should be no more than 1,000 words long, and double-spaced, typed copy would be most appreciated.

With the "80-hour rule" every task in a system development, regardless of the size of the total system, can be quantified in measurable work units that do not exceed 80 hours of effort. Regardless of the nature of the task, it must be divisible into units of work not longer than two man-weeks, Keane said.

The virtue of the rule is obvious, the newsletter went on. First, it makes manpower assignments very straightforward.

Second, by segmenting large jobs into a string of small work units, it assures – at the outset of the project – a thorough and thoughtful step-through of every element in the total system.

Thirdly, it totally eliminates guesswork measurement. The task, at the end of 80 hours, is either finished or it's not.

"How applicable is the rule?" Keane asked rhetorically. Totally, it answered.

"In fact, one of the best measurements of the initial project work plan, and its orderliness and completeness, is to attempt to block it out into discrete work assignments not exceeding 80 hours each.

"With minor effort, you should be able to do it. If you cannot," the newsletter warned, "you are in for the type of project management problems that keeps fatalism alive and well in the software development profession."

Copies of *The Consultant* are available from Keane, 36 Washington St., 02181.

'Engineering' to Be Reviewed

NEWTON, Mass. – Software engineering means more cost-effective and reliable software through improved analysis, design and implementation, according to Dr. John W. Brackett, vice-president of Softech, Inc.

Brackett has developed a course designed to show managers how to increase programmer productivity through software engineering.

The two-day seminar will be offered by The Conference Co. in New York City Oct. 6-7 and in San Francisco Nov. 10-11.

Attention will be focused on the "high-leverage" areas, especially methods for improving the analysis and design process. These are particularly important, Brackett said, noting a recent Department of Defense survey showed 64% of software errors stemmed from these areas.

The course is designed to familiarize technical managers with the software engineering methods available today, including structured programming, structured analysis (a Softech technique), top-down design, implementation and testing and new approaches to managing the development process, Brackett said.

The enrollment fee for each seminar is $300. The Conference Co. is at 797 Washington St., 02160.

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Data Briefs

Syntech Modem Suited For Multivendor Nets

ROCKVILLE, Md. – The ESP-201 modem from Syntech Corp. is a Bell 201-compatible unit that is said to be especially suited to networks using more than one vendor's modems.

The ESP-201 automatically senses the interface requirements and provides the necessary response, the firm said.

For example, when switched to a dial line, it will automatically provide fast turn-around; when switched to an auto-dial line, it will automatically provide the answerback tone; or when switched to a Bell modem, it will automatically provide the necessary handshake interface.

Additional features include built-in diagnostic testing, data quality indicator, status indicator lamps, manual busy-out switch and a call abort timer.

The ESP-201 costs $1,350 or $67/mo on a two-year lease with deliveries beginning in November from the firm at 11810 Parklawn Drive, 20852.

DCS Adds Short-Range Sets

DANBURY, Conn. – Data-Control Systems (DCS) has introduced two short-range data sets intended for large facilities or campuses where twisted-pair cabling is available.

Transmission ranges of up to 10 miles are possible, depending on wire size and data rate, the company said.

The SR-200, a synchronous data set, will operate at speeds of 2,400-, 4,800- and 9,600 bit/sec and 19.2 bit/sec. It provides all the necessary clocking signals for operation with synchronous data terminal equipment.

The SR-100, an asynchronous data set, will operate to 1,000 bit/sec.

The SR-100 and SR-200 can operate in either a point-to-point or a multipoint environment. An additional cost savings can be realized because both units will operate at full and half duplex in a four-wire network.

The SR-100 costs $300 and the SR-200 costs $500 from the firm at P. O. Box 584, 06810.

Paperless Claims Net Gets Data at Source

JACKSONVILLE, Fla. – Blue Cross of Florida, Inc. and Blue Shield of Florida, Inc. have developed a "paperless" claims-processing communications network which involves collection of data from originating sources.

The network includes a central DP facility at the groups' corporate offices here, a network of data terminals installed at offices throughout the state and a configuration of pollers and communications adapters which serve as interfaces between the data terminal network and the central facility.

"This new data communications network is a vast improvement over our previous admissions and data collection systems, and we estimate substantial savings will result," according to Cecil Rivers, vice-president of DP for Blue Cross and Blue Shield.

"With an expected volume of over 12 million claims by 1978, this system will make an important contribution to holding down future costs of services provided by our Blue Cross and Blue Shield of Florida plans," he added.

The terminal data-capture process now allows information to be entered and edited off-line at the source and transmitted at high speed to Jacksonville. By reducing admissions and claims-processing time by as much as eight days in some instances, the system enables the medical plans to speed claims payments to patients, hospitals and physicians.

Two-Year Search

"We studied data terminals and companies manufacturing them for two years before making our decision. Ultimately, we determined we needed terminals that were capable of meeting our system requirements in terms of data input/output and transmission . . . terminals that naturally complemented hospital and medical office environments," C.R. Scott, director of DP planning for Blue Cross, said.

"They had to operate as quietly as possible and, at the same time, be compact in size . . . and, of course, we needed terminals that were low in cost, since we were talking about a rather sizable capital investment," he said.

After several months of careful evaluation, Blue Cross and Blue Shield selected Texas Instruments (TI) to install several hundred of the Silent 700 data terminals in hospitals and doctors' offices throughout the state. TI is also installing a number of its Model 960 minicomputers in Florida to serve as polling systems and communications adapters between the Blue Cross/Blue Shield central IBM 370 mainframe and remote locations.

The terminals use a quiet thermal printing technique, an important feature for hospital environments as well as medical offices. They fit into the existing data communications network with switch-selectable data printing speeds of 10-, 15- or 30 char./sec and data transmission speeds ranging up to 120 char./sec.

Questions and Answers

For hospital communications, TI replaced a network of mechanical teletypewriters with some 200 Silent 700 Model 733 automatic send/receive (ASR)

(Continued on Page 30)



Terminal Ahoy!

PRINCETON, N.J. – Oarsmen at the recent U.S. team trials here for the World Championships were able to view their relative positions during the race from computer-generated output.

The printout depicted where each boat was in relation to the other boats during each of the 500-meter points of the race, as well as the split times.

The system, designed by Kent Mitchell, a former Olympic coxswain, utilized a portable terminal, a digital clock and a remote central processor.

Buttons punched by volunteer timers at the start and at each 500-meter interval of the 2,000-meter race transmitted signals to receivers tuned for each lane.

The receiver closed a switch which signaled the clock to record the elapsed time and to display the digital time to the nearest 1/100 of a second.

Times for each lane were then fed to a Hewlett-Packard computer through a Computer Transceiver Systems portable terminal and computed results were printed out.

For Local Forms Control

Incoterm System Emulates IBM 3270

NATICK, Mass. – Incoterm Corp. has developed an enhanced software emulator for local forms control that operates on its IBM 3270-compatible SPD 20/20 terminal system.

The emulator provides the SPD 20/20 with more features at lower cost than the IBM 3270, Incoterm said.

Primary emphasis of the system is on maximizing the efficiency of local forms and data storage while minimizing the core requirements for new programs and disk buffers, a spokesman said. He described the system as compatible with IBM 3270 data communications protocol, but said it offers extended data entry capability.

Designated the SPD 20/20 LFC, the system operates at speeds from 1,200- to 9,600 bit/sec, with no modifications in software. It consists of a terminal processing unit with 32K core memory, up to eight SPD 20/20 display terminals, up to three dual diskettes, a cyclic check controller, synchronous communications controller and either P-100-2 (100 char./sec) or P-165B-2 (165 char./sec) printers.

The SPD 20/20 LFC system operates under the SPD/DOS diskette operating system which resides on the system disk. At installation and initialization time, the program object file and the files for the forms directory and forms storage are configured under DOS to reside on the system disk.

The data files and their directory are configured as DOS data files and are assigned to disks other than the system disk. This permits replacement of the data disks for unlimited off-line temporary data storage.

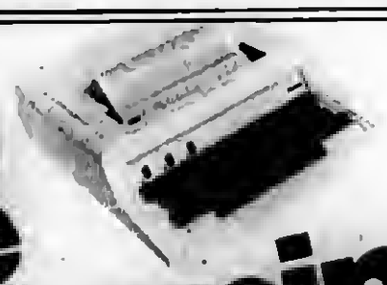
All forms and data storage utilize the standard Ascii character set regardless of the code specified for the 3270 communication discipline, the company said.

A typical system with six CRTs, a dual-diskette drive, a terminal processing unit with 32K of storage, communications controller and 165 char./sec printer costs about $34,915, or about $5,469 per terminal.

A comparable six-terminal 3270 system costs about $54,388, or $9,065 per terminal, which makes the Incoterm system about 36% less expensive than the IBM 3270, an Incoterm spokesman said.

The Incoterm system is $1,085/mo on a three-year lease. First deliveries are scheduled for early 1976 from 6 Strathmore Road, 01760.

MINITERM, big name for the smallest NEW terminal



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'Paperless' Claims Processing Starts With Source Data Capture

(Continued from Page 29)

twin magnetic tape cassette data terminals, which were placed in hospitals. These terminals met all the criteria established by Blue Cross, including compatibility with established operating procedures for data entry and transmission of hospital admissions information.

In effect, the process is a question-and-answer sequence. A format tape "asks" the same questions that appear on a Blue Cross admissions form, which the hospital clerks use as source information for keying admissions data into a local data terminal.

As admissions data is entered at the remote location, the entries are stored on a cassette. After business hours, the operator switches the terminal on-line.

Then, when the polling units in Jacksonville call the local sites, the terminals automatically answer and transmit the day's admissions information to the corporate headquarters over voice-grade phone lines. The polling system passes data to the computer for processing, which occurs immediately, and subsequently transmits a response to the originating terminal.

Transmission errors have been minimized and downtime has been noticeably reduced, compared with that of previous equipment. The magnetic tape procedure of the terminal enables operators to correct errors in a fraction of the time previously required, Scott said.

The TI Model 742 programmable data terminal was selected for installation in doctors' offices to collect data directly from originating sources.

The operating procedures for this terminal are essentially the same as those for the terminals used in the hospital communications network.

Another phase of the paperless claims processing network is the in-house data entry portion, which will eventually be installed in the corporate headquarters in Jacksonville. This portion will also use intelligent programmable terminals providing source-editing capabilities.

Terminal Transactions

Model 340 Version Designed for Minis

ANN ARBOR, Mich. – Sycor, Inc. has introduced a version of its Model 340 intelligent terminal – with an Ecma/Ansi-compatible cassette recorder – designed primarily to interface with small business computers.

The Model 340-E is functionally the same as the company's earlier Model 340 terminal.

The Model 340-E with its Ecma/Ansi-compatible recorder features a read-after-write head for improved data throughput, a data capacity of 2,000 80-character records or 950 256-character records on 280 feet of cassette tape and an error rate of less than one error in 10^9 bits.

The Model 340-E terminal uses a phase-encoded recording technique and may write on both sides of the tape cassette, thereby increasing the storage capacity from 240,000 characters per tape to 480,000 characters.

Users of the NCR 399, the Honeywell Series 60 and the Litton 1300 small business system should be particularly interested in the data entry and preprocessing capabilities of the Model 340-E, a Sycor spokesman said.

Options on the terminal include a flexible disk recorder, four speeds of printers, three magnetic tape drives, card readers and both asynchronous (110- to 1,200 bit/sec) and binary synchronous (1,200- to 4,800 bit/sec) communications.

The Model 340-E with one recorder is priced at $216/mo on a one-year lease and $184/mo on a two-year lease; both prices include maintenance. The purchase price of the Model 340-E is $7,800. Deliveries are expected in the fourth quarter from 100 Phoenix Drive, 48104.

Schools to Get Cut On Price of Portacom

STAMFORD, Conn. – Dataproducts Corp. will offer schools a special 5% price reduction on its portable typewriter terminal, Portacom.

By discounting the price of the $1,495 data terminal to $1,420, the firm hopes to position Portacom well within the range of most public school system budgets and encourage greater use and interest by secondary school students in computer use, a spokesman said.

The 31-pound data terminal comes in a briefcase and features an Ascii keyboard, separate numeric key pad, RS-232 connector, built-in acoustic coupler, an impact printer that uses ordinary paper, switch-selectable parity and full- or half-duplex.

Delivery of Portacom is 30 days. Dataproducts Telecommunications Division is located at 17 Amelia Place, 06904.

FEC 772 Display Offers Alternative to IBM 3277-2

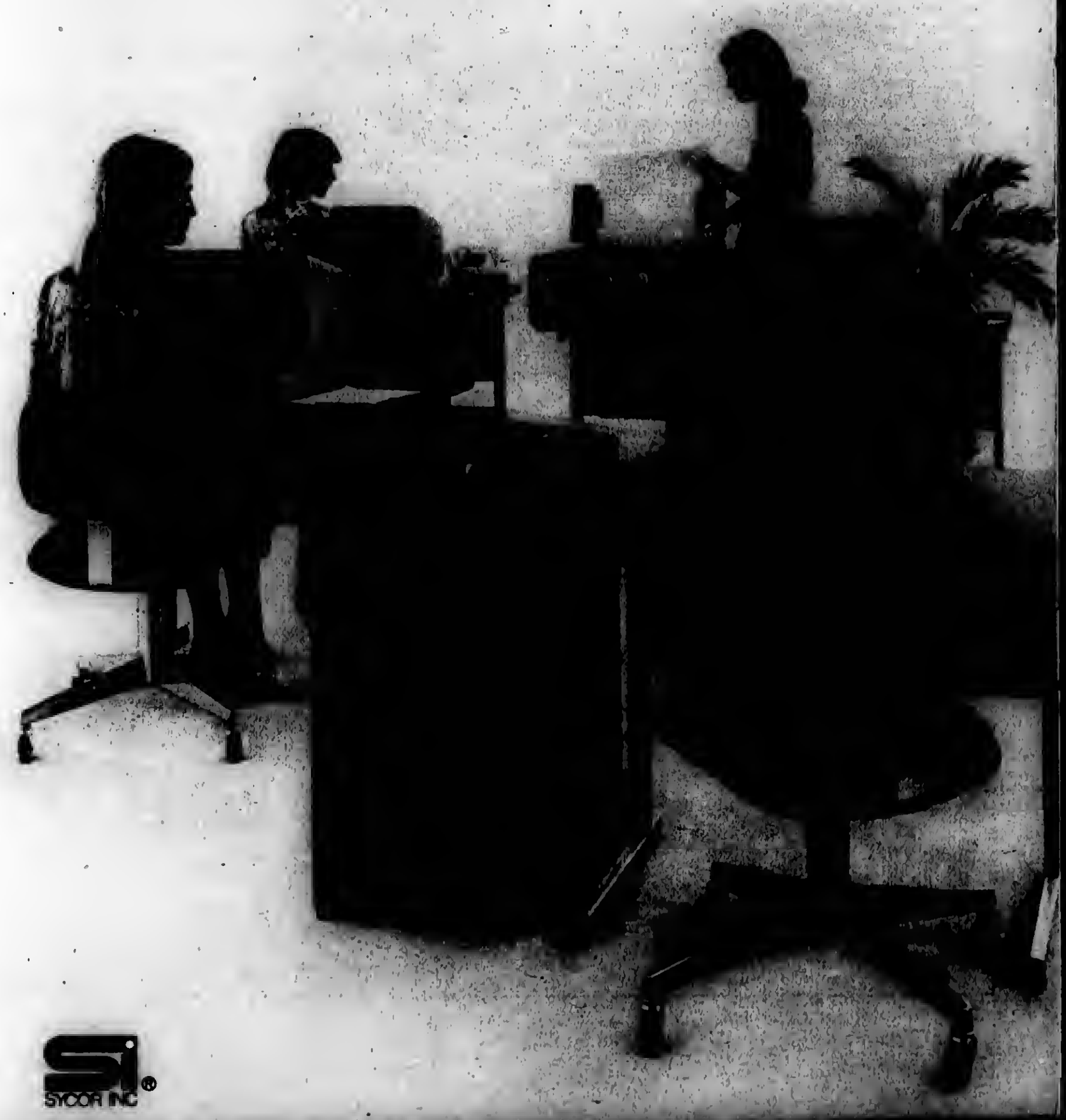
HOUSTON – The Model 722 display station from Financial Electronics Corp. (FEC) is described as a plug-to-plug replacement for the IBM 3277-2.

In addition, the Model 772 offers a home cursor key, capability to display both upper and lower case, input field identifiers, operator-selectable attribute character display and generation for display format composition and debugging and block cursor.

The Model 722 plugs directly into the same cable from an IBM 3271-2 or 3272-2 controller that is used for an existing 3277-2 display station. Model 772s can also be operated together with Model 3277-2s on the controller, FEC stated.

Priced at $3,800, the terminal is available from the vendor at 9730 Town Park Drive, Suite 101E, 77036.

THE NEW SYCOR 440



SYCOR INC

'Cash Plus' Lets Customers Combine Shopping, Banking

MILWAUKEE – Since the beginning of this summer, nearly half a million savings and loan customers here have been able to process bank transactions directly from local grocery and department stores.

A Jewel Food Store on the west side of the city was the first store to go on-line with 21 savings and loan associations corresponding through the computer system of the Midland National Bank here.

Called "Cash Plus," the system works through Remote Service Units, Ltd., (RSU), a service company set up by the savings and loan associations in cooperation with the Midland National Bank, Wisconsin Jewel Food Stores and Copp Department Stores.

"Cash Plus gives savings and loan customers holding regular passbook accounts the convenience of being able to complete transactions while doing their regular shopping," Gerald Levy, president of RSU and also president of Guaranty Savings and Loan Association here, said.

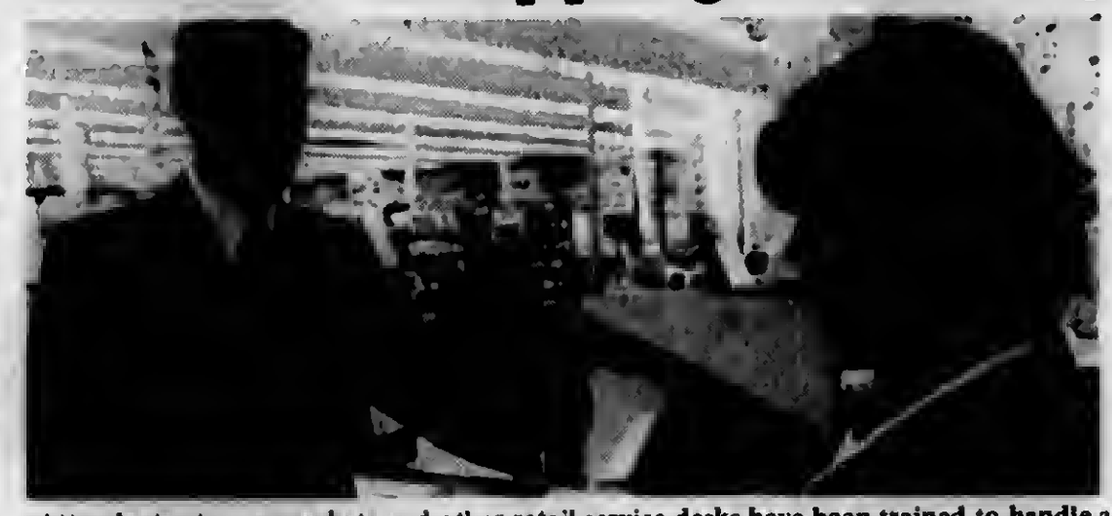
"In addition, it greatly extends the hours the customers can do business with their savings and loan associations. Their accounts are now accessible 80 hours a week, during the stores' regular business hours, instead of the 42 to 46 hours the savings and loan associations are open," he said.

The service also gives savings and loan customers the ability to earn interest on their accounts right up to the moment funds are transferred, he added.

Cash Plus Customers

The savings and loan customer whose application for Cash Plus has been accepted receives a plastic account card with a magnetic stripe on the back that has been encoded with his account number and identification.

To access his account, he simply hands the card to the store's service desk attendant, who inserts it in an NCR 279 terminal. The customer then uses a remote keyboard to punch in his own personal identification number (PIN) which is known only to him.



Attendants at supermarkets and other retail service desks have been trained to handle a full range of account transactions using NCR 279 terminals linked directly to Midland National Bank's Burroughs 3700, which services the 21 participating savings and loan associations.

The terminal calls up his account at his savings and loan association through Midland National Bank's Burroughs B3700. Leased lines and Bell modems now link 12 NCR terminals in 12 stores to a Varian front-end processor, which in turn controls transaction traffic coming into the mainframe.

If the card holder makes a mistake in keying in his PIN, the computer will refuse access to the account, but will allow a second chance for entry of a correct identification code. Should the customer continue to key incorrect numbers, the account cannot be accessed and the attendant will retain the card.

Thus, the system provides the necessary safeguard against anyone overhearing the number, as is possible in the case of audio systems, or of anyone making use of a lost or stolen card.

Once the account has been accessed, the attendant keys in the transaction as written on a deposit/withdrawal slip filled in by the customer, and the money exchange is completed. The card, along with a written record of the transaction, is then returned to the customer.

Terminal Transactions

Simplicity, Speed of Operation

RSU selected the NCR 279 terminal on the basis of its simplicity and speed of operation, along with the confidentiality of the PIN and the hard copy of the transaction it provides, according to Levy.

"There is also a fail-safe feature in a magnetic tape cassette that captures transactions in the event telephone lines or the computer are down," George Dalton, vice-president of Midland, explained. "In this way, the service desk in the retail outlet is able to conduct business as usual, even if a portion of the system is not in operation."

Still another feature Dalton feels will be useful to many merchants is the fact the terminal need not be totally dedicated to the Cash Plus system, but provides the merchant added utility of unassigned keys that might be used for other transactions. Many stores and savings and loan associations can thus provide such services as payment of utility bills or the purchase of money orders.

The result of the first weeks on-line with the program have been encouraging to the savings and loan association members, Levy said.

"We have already had a considerable amount of activity and have generated a great deal of interest," he said. "We look

(Continued on Page 33)

Clustered data entry and concurrent processing with shared files...$677 a month.

The Sycor 440 System: the newest addition to our family of compatible intelligent terminals.

Our new distributed processing system lets you perform data entry and inquiry/response concurrent with background processing. So you don't need multiple systems to do multiple jobs. At $677 a month (for four keyboards, communications, cassette, and a five mb disk on a three year lease, with maintenance) you can perform all these functions—plus many more you never thought possible at such a low price.

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TAL II. To extend the 440's power, use our new data entry language, TAL II. This easy-to-use, high-level language lets you customize data entry programs. Instructions are also provided for arithmetic operations, conditional data entry, range checking, table look-up, equal/compare and a host of other intelligent features.

Shared file access.

The 440 system lets you share and access files locally, reducing investments in telephone communications and central CPU resources.

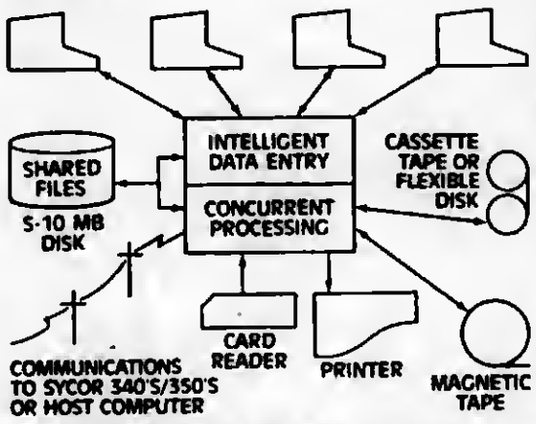
Data entry made easy. Now each operator, at her own display, can make use of current data in shared files to support data entry functions. For reduced keystrokes and lower error rates.

Inquiry/Response. File look-up is made simple with up-to-date information on-site, using the 440's own file management and disk storage capabilities.

System modularity.

Design your own system with a variety of options and peripherals.

Supports from 1 to 8 displays. Each is controlled by the Sycor processor and is capable of performing tasks independent of other displays.



Choice of 5 and 10mb disks. Store and retrieve programs, shared files, and data at remote locations.

Wide variety of peripherals. And to complete our system configuration, choose from matrix and line printers, computer-compatible tape drives, card readers, and a variety of communications options.

Compatibility.

There's full software compatibility with our Model 340 and 350 stand-alone terminals. Keyboards are also compatible.

Programming. One program fits three different systems—340, 350 and 440.

Communications. Communicate with the mainframe, emulating IBM 2770, 2780 or 3780 protocols. Or use the 440 as a polling station at your central computer site to receive and transmit data to remote 340s, 350s, and 440s.

Concurrent processing.

And best of all, while data entry is being performed in the foreground, you can be doing other jobs concurrently in the background. Jobs that can save you time and money. Jobs like:

Remote job entry. Use the 440 with its card reader and 300 LPM printer for large-scale remote job entry. And since the system contains a CRT and a keyboard, you don't pay extra for them.

Multi-terminal printer support. Each display can interleave print data to one printer as the data is being entered. So, you don't need a separate printer for each display.

Report generation. Sycor-provided programs let you produce all sorts of management reports—sales analysis, inventory, or billing—at the same time as you are performing data entry.

File maintenance. And the Sycor 440 allows you to do editing, sorting, updating, and file transfer in a background operation.

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All this for just 6¢ a month, considering the 20-year warranty.

Epoch 4. It's a great way to save a mint, for only pennies a day.

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Reallocates Materials

Net Controls Steel Plate Facilities

PORT KEMBLA, Australia – An Australian steel works uses on-line data communications to monitor and annually reallocate more than 15,000 tons of plate without taking individual plates off the production line.

Australian Iron and Steel Pty. Ltd. (AIS) employs a network of some 80 terminals to provide on-line control for its flat products facilities here. Last year the group produced more than three million tons of steel plate, strip and tinplate.

By constantly monitoring its plate mill and finishing lines via terminals, AIS is ensured an uninterrupted production flow despite changes in steel plate characteristics that may occur during the processing of a particular order.

Whenever a plate with order-differing specifications is produced, the terminals communicate these new characteristics to one of two central-site Control Data Corp. 3500s. The mainframe then searches its file of up to 25,000 customer orders for one that requires a plate meeting the changed specifications and sends the new order allocation back to the terminal located beside the finishing line. The plate is reallocated to the new customer.

This process is completed in less than 10 seconds, thus allowing continuous production of plates with varying characteristics for different customer orders, without removing plates from the production line.

The system, installed in January 1974, reallocated its 25,000th ton last July. Over 17,600 tons were reallocated for the 12 months ending in May, according to R.A. Hardy, manager of systems and data processing for the firm.

In addition to a significant improvement in plate yield, Hardy noted, cash flow is optimized now that material does not have to be stocked and rehandled when finishing line capacity becomes available.

The system has also improved "starting point" yield, that is, automating production planning used in producing the plate rolling schedule, Hardy explained.

AIS developed the reallocation and other real-time production control operations using two CDC 3300 computers and on-line communications terminals installed throughout the Port Kembla Works since the late 1960s. The upgrade to the dual 3500 systems was completed last month.

The company also operates a remote batch terminal connected to the CDC 6600 computer in CDC Australia's Cybernet center in Sydney to support its off-line DP requirements.

AIS plans to increase the number of terminals in its network by installing two Digital Equipment Corp. PDP-11/40 minicomputers to perform front-end message switching and line control functions. The systems will link the central-site 3500s with computers and terminals now in and planned at the plant The overall system was designed for more than 98% real-time communications availability.

One for Two

MT. LAUREL, N.J. – Spectron Corp. has a modem eliminator, the ME-81, that permits direct connection between terminals and computers without the need for modems.

It is intended for applications where transmission over short distances would otherwise require two modems connected back-to-back.

An Identical Interface

One ME-81 replaces the two modems. The unit presents an identical interface to the business machine as a modem and operates at speeds up to 20 kbit/sec over a distance of 50 feet.

The clock frequency and Clear to Send delay are specified by the customer.

Price is $240 from the firm at Church Road and Roland Ave., 08057.

Tech Control Module Added to Cooke Line

ALEXANDRIA, Va. – Cooke Engineering Co. has added another module to its line of Dynapatch and Dynaswitch data communications tech control modules.

The unit is a combined programmable digital fallback switcher with four-wire VF signal patching. This feature is said to permit retouring signals for 16 channels at the digital and analog sides of modems.

The unit handles 16 full-duplex EIA RS-232C digital channels and 16 four-wire VF channels, the company said.

In the digital interface, the unit provides patching and programmable "fallback" switching of individual channels or all 16 channels as a group, the company added.

Prices are $4,500 ($281 per channel) when equipped with 12-circuit Dynapatch EIA jacks and $4,775 ($298 per channel) when equipped with 16-circuit Dynapatch jacks. Delivery is 30 days from the firm at 900 Slaters Lane, 22314.

'Cash Plus' Allows Shopping, Banking

(Continued from Page 31)

for Cash Plus to be a real boost to the savings and loan business."

Social Security Funds

"Direct deposit of Social Security funds, for example, which did not look too good for savings and loans in tests in Georgia last spring, is quite feasible through electronic funds transfer systems (EFTS)," Levy noted.

RSU members are not alone in their enthusiasm for Cash Plus; the merchants involved are equally pleased with the system.

Among advantages to the merchants, "Cash Plus has allowed us to provide an added service to our customers on a one-stop shopping system, in addition to broadening our own customer base with some 500,000 savings and loan customers who are potential Cash Plus users," Robert Neslund, vice-president of Jewel Food Stores' Wisconsin Division, said.

Still another advantage to the merchant, he noted, is the guaranteed check feature built into the system. Since checks are deposited to and cash is withdrawn from depositor savings accounts, the store has no liability for checks processed against the Cash Plus system.

"As the system gets underway, it should reduce our cash-on-hand requirements, particularly on paydays," he said. "And should a bad check be presented, it is the responsibility of the savings and loan associations, not the store."



Why the last five years saw us grow from 2 units in place to 12,895 in a field that's as competitive as they come.

In the data terminal business, it takes more than a great product to produce that kind of upward motion.

It also takes a combination of instant response and superior service.

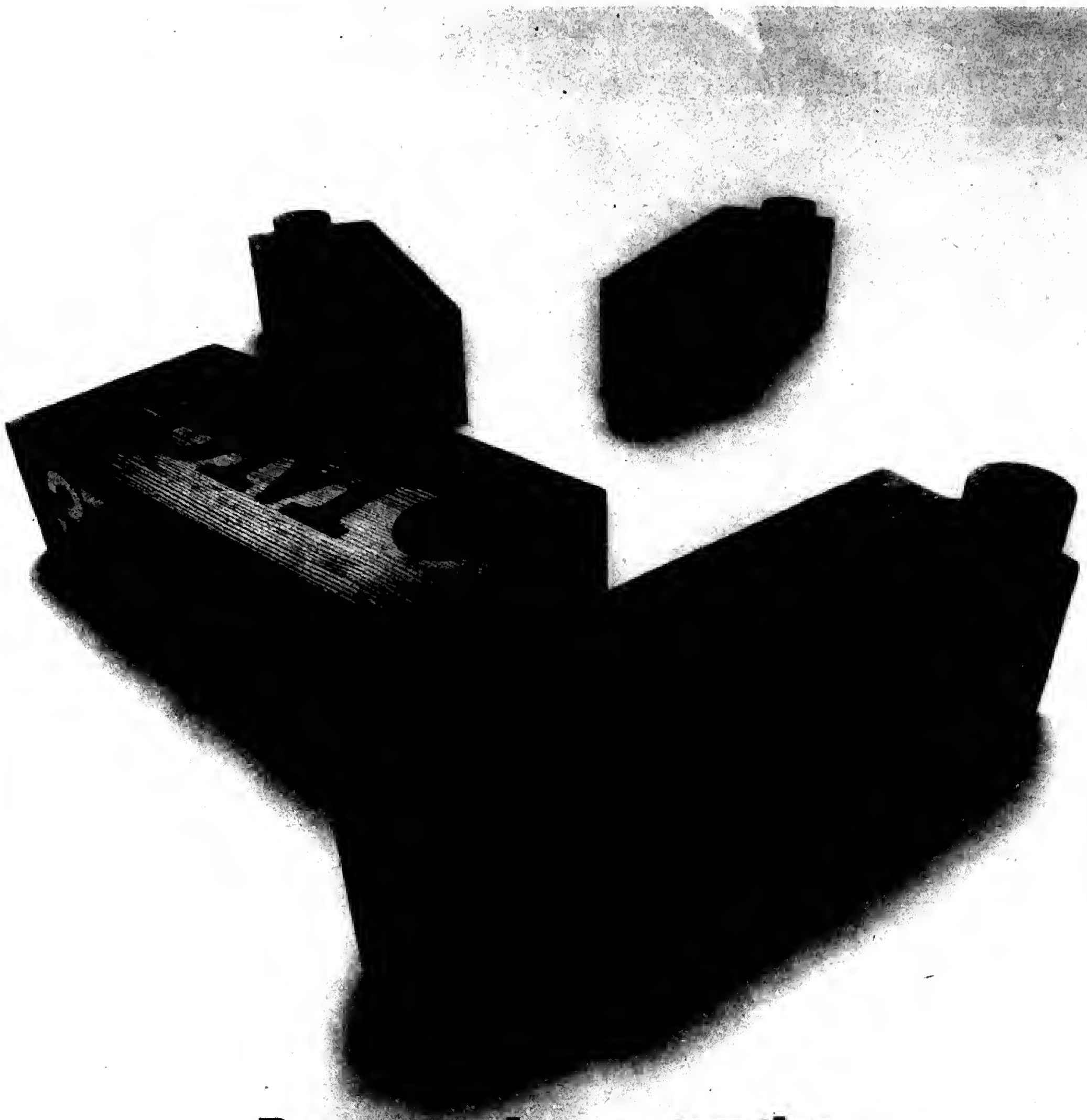
That's why TCI is not just growing, but growing fast. From ground zero in 1969 to 355 units placed by 1971, 3,540 by 1973, 12,895 by 1975. And we've grown in the face of stiff competition. By developing, making and servicing quality data terminals and other communications equipment. Tailored to the needs of users like hotel and motel systems. Medicine. Trucking. Insurance industries. With a demonstrated willingness and ability to customize equipment for special needs.

More evidence of our growing power: a service network that now has people in more than 90 cities. And service is coordinated from our Raleigh headquarters, so any problem gets 24-hour attention.

All of which makes TCI pretty unusual. Fast and flexible, yet stable and reliable. With the solid backing of a $3.3 billion blue chip corporation. All of which makes us a company with what it takes to keep right on going. And growing. Terminal Communications Inc., 3301 Terminal Drive, Raleigh, North Carolina 27611.

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Bits & Pieces

Microform Readers, Printers Listed in Auerbach Report

PHILADELPHIA, Pa. – The "Auerbach Guide to Microform Readers and Reader/Printers" describes the capabilities of different vendors' devices, provides interviews with current users and offers comparative analyses.

The guide includes a tutorial and market overview report on microform readers, reader/printers and enlarger/printers; in addition, it offers advice on how best to match user needs with the proper equipment, Auerbach said.

A search chart lists about 200 devices from some 60 manufacturers. There are technical reports on about 45 readers, reader/printers and enlarger/printers.

The guide costs $19.95 from thc firm at 121 N. Broad St., 19107.

Dymat Offers Portable Fiche Reader

SANTA MONICA – Dymat Photomatrix Corp.'s Model 600 microfiche reader is a portable table-top with high-resolution optics and uniformity of screen brightness that keep eye strain to a minimum, according to the firm.

Other features include variable light intensity and a ball slide X-Y platen for easy movement while maintaining track control in selection of rows and columns.

The reader costs $1,500 from the firm at 2225 Colorado Ave., 90404.

Unit Converts IBM Cards

JESSUP, Md. – Digi-Data Corp. has introduced a system which converts IBM magnetic cards to 9-track, 800 bit/in. computer tape.

Data is transferred at 50 char./sec with the IBM magnetic card reader in the "skip" position.

Purchase price is $4,000; twelve-month lease is $185/mo.

The firm is at 8580 Dorsey Run Road, 20794.

Data View Reduces Viewer Costs

MENOMONEE FALLS, Wis. – Data View, Inc. has reduced the price of several of its microfilm viewers and accessories.

The firm's Model 760B (3/4 computer output microfilm viewer) now costs $159, down from $185, and the Model LF-1011 (1-1/2 page) costs $175, down from $185.

The Model LF-1015 (2 page) is now $229 rather than $245; and the Model LF-1018 (2-1/2 page) is priced at $259 rather than $305.

Data View is at P.O. Box 537, 53051.

Uses Xerographic Techniques

Users Laud Off-Line Unit's Print Quality

By Edith Holmes
And Patrick Ward
Of the CW Staff

Two users of the Xerox 1200 high-speed xerographic printer have reported improved print quality and throughput over the impact printers they had used before.

Both users also mentioned minor cost savings over impact printing, but said that was a secondary benefit.

Neither user was worried by Xerox's departure from the mainframe scene [CW, July 30]; they view the 1200 as a copier product and expect Xerox will now be able to concentrate on that product line.

Xerox introduced the 1200 in 1973 in a move that combined the firm's copier and computer technology. The 1200 has its own internal minicomputer and provides off-line, nonimpact "xerographic" printing from industry-compatible magnetic tapes.

The system prints on unsensitized 8-1/2-in. by 11-in. paper at the rate of one page per second.

Both the page size and printing speed were important points to Scliing Areas Marketing, Inc. (Sami) when it chose a printer last year.

The company generates some three million pages of market research reports each month for clients that manufacture products sold in grocery stores, according to Dan Minter, an administrative assistant with the firm.

It was this heavy and growing print load, combined with the need to get the information to the clients quickly, that causcd Sami to choose the Xerox 1200, he said.

"Printing monthly marketing reports had required as much as 450 hours of impact printing and 1,900 hours of duplicating and reducing time on computer forms printers each month," Minter said.

"We hoped the 1200s would reduce total throughput time by several days," he added.

Five Xerox 1200 printers were scheduled to replace seven Xerox 2400 impact printers in July 1974, but various snags slowed the installations.

"We were one of the first customers to take delivery of the 1200 and we experienced a lot of mechanical problems," Minter said. "But Xerox got those squared away reasonably fast.

"Sami's current total of six Xerox 1200s have allowed us to maintain our delivery schedules even though print volume is increasing," he said. The 1200s have also given the firm added capacity for other applications that require about 500,000 pages per month, he noted.

The 1200's 8-1/2-in. by 11-in. output costs Sami less than 1 cent/page. The bond paper used is price-competitive with continuous form paper, he added.

"Our clients were just delighted when we went to the 8-1/2-in. by 11-in. paper. It's easier to store and handle, and the print quality is absolutely superior to what we were experiencing with impact printers," he said.

Setup for different printing jobs is easier than in impact printing, Minter said. The overlays for producing differing forms are made up and changed easily, he commented.

The printer operator just punches a couple of buttons to control the job definition language – the equivalent of the carriage control tape in an impact printer, he explained.

Quality the Goal

High print quality was the goal of a large East Coast utility when it replaced several impact printers with Xerox 1200s last year.

"We have high volume, more than two million pages a month, and we wanted better control of the printing operation and a cleaner and more timely product," the manager of DP equipment planning said.

Thc Xerox 1200 provides a third copy as good as the first and avoids the time-consuming bursting and decollating stage, he said. The paper size also makes binding reports more practical, he added.

Job setup is easier and, as an off-line device, the 1200 allows the operator complete control over his environment, he said.

The single paper size and usc of overlays simplifies forms control and storage, he said.

Use Requested

"All of our objectives – better control, better use of forms and better user satisfaction – have been met," he said. One measure of the system's success is that corporate users have asked the utility's DP shop to produce their particular reports on the 1200 system.

The anonymous user did indicate "the 1200 had the normal problems of a new piece of equipment being introduced. This is a mechanical beast," he remarked.

"Reliability and maintenance have been satisfactory," he concluded.

Key-to-Disk Users Satisfied, Don't Plan to Switch: Datapro

DELRAN, N.J. – Users of key-to-disk and key-to-diskette data entry equipment are generally well satisfied with their systems and fewer than one out of five plan to change to a different method of data entry.

Conversely, more than half of the users of keypunch, key-to-tape and key-to-casscttc devices are planning a switch to other data entry tcchniques, according to a survey by Datapro Research Corp.

Thc survey drew response from 400 users with 823 data entry devices and systems representing a total of 6,684 keying stations.

They were asked to rate the overall performance of each data entry device or system they were using.

By assigning a weight of 4 to each user rating of excellent, 3 to good, 2 to fair and 1 to poor, Datapro calculated the following weighted average user ratings for each class of equipment: key-to-diskette, 3.8; key-to-disk, 3.5; 96-column keypunches, 3.4; 80-column keypunches, 3.2; key-to-cassette, 3.0; key-to-tape, 3.0; and on-line data entry, 3.0

Another question asked the users to report any plans for changing to a different type of data entry equipment.

Among the users of key-to-diskette units, 11% plan to switch to on-line data entry, 4% to key-to-disk systems and 4% to other methods; 81% plan no change.

Keypunch users reported the following changeover plans: 26% to key-to-disk, 17% to on-line data entry, 12% to key-to-diskette, 4% to key-to-tape and 2% to other methods. But 46% of the keypunch users plan no change, Datapro said, adding the percentages total more than 100 because some users plan to utilize two or more input techniques.

Among the users of key-to-cassette units, 42% plan to switch to key-to-diskette, 8% to key-to-disk and 8% to other techniques; 42% plan no change.

Among users of single-station key-to-tape recorders, 30% plan to changc to on-line data entry, 18% to key-to-disk, 16% to key-to-diskette and 2% to other methods. Only 36% of the key-to-tape users plan no change.

The survcy results, together with the user ratings earned by more than 40 popular data entry deviccs and systems and an analysis of the responding users' data entry workloads, were included in the July supplement to *Datapro 70*.

Among the users of shared-processor key-to-disk systems, 13% plan to change to on-line data entry, 1% to key-to-diskette units and 4% to other input techniques; 82% plan no change at all.

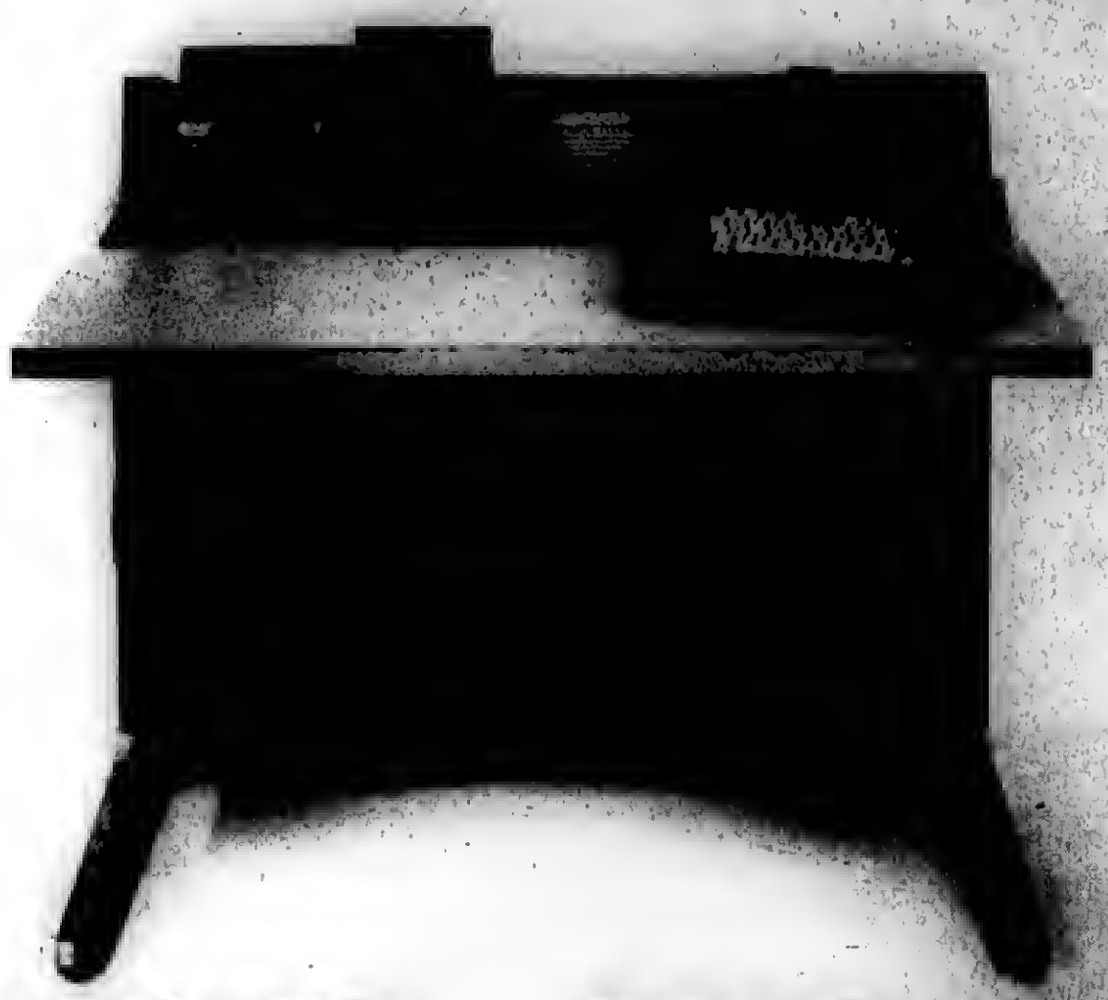
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Combines Beehive Terminals, Nova

Tesy Edits Text of Optically Scanned Typewritten Data

ST. LOUIS – The Terminal Editing System (Tesy) from Electronic Keyboarding, Inc. (EKI) utilizes multiple Super Beehive terminals hard-wired to a Data General Nova to edit, update and store text material captured through optical scanning of typewritten documents or entered on IBM-formatted magnetic tapes.

The Nova in Tesy is normally supported by a 25M-byte IBM-type moving-head disk, an industry-compatible 9-track magnetic tape, a 1,000 line/min. electrostatic printer and a computer console, EKI said.

Translates to Ascü

The system translates the original data code to Ascü and creates lines of text, with 70 characters on each, including spaces. Tesy recognizes special formatting control characters for such operations as paragraphing and assigns line numbers to the stored text output.

Various management facilities are provided. The user has the option, for example, of printing on-line a full upper- and lower-case edit list for subsequent proofreading.

The system provides for segmentation of a job, under program control, into batches accessible by only a single terminal. It can also accumulate various totals such as characters read, records read and lines printed, the vendor said.

Finally, Tesy creates an Isam-type file of the text material, accessible via the CRT devices.

To use the system, the operator must key in an acceptable identification number, but Tesy is designed to allow several retries if the first number keyed was erroneous. Once "approved," the operator keys in batch number and project to be edited.

The operator is allowed to work through an entire text data file page by page with a terminal control key. Once the page to be changed is located, a blinking cursor can be moved to the point where the correction is to be made.

Editing commands allow character insertion, replacement or deletion as well as line insertion and deletion. Maintenance of the same line numbers throughout the life of a file enable users to audit the changes made over time, the vendor noted.

If insertions cause a new line to be created, it is given a number between the two on either side of it.

A typical Tesy system costs under $80,000. Delivery is three to four months from the firm at 140 Weldon Parkway, 63043.

Microdisc Gets Mag Tape I/O, Software Option

ST. PAUL, Minn. – Minnesota Mining and Manufacturing (3M) has added a magnetic tape input/output unit and a software option to its Microdisc parameter-search microfilm retrieval system.

The input/output unit permits computer- or keyboard-generated data on tape to be written onto the disk storage in the Microdisc system. The I/O unit is especially suitable for input of index data stored on a host computer, facilitating the search of blip-coded film cartridges produced by a computer output microfilm (COM) device, 3M said.

Used in an output mode, the tape unit can create tapes from which COM units produce film indexes to retrieve older documents in the file.

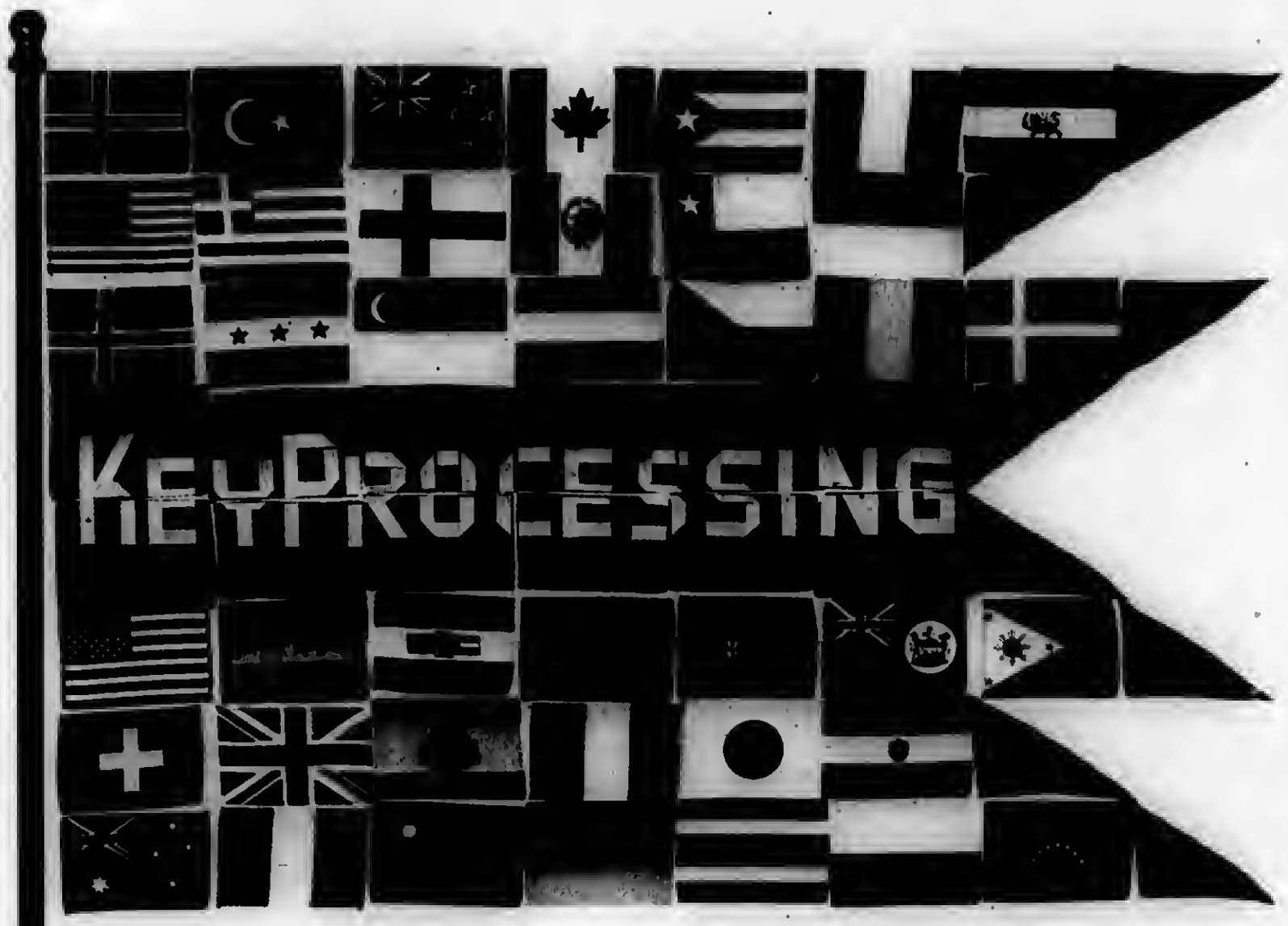
Scana Indexes

The interpolative search module allows scanning of long lists of index data to determine the microfilm frame on which a desired item is located. The terminal index reference for each frame is stored in the Microdisc memory, and the system indicates that a desired item (falling between two such references) must be on a specified microfilm frame.

The Microdisc system consists of a minicomputer, disk storage unit, CRT terminal and page reader/printer. The system enables the user to search for specific frames of microfilmed data by their content parameter.

While this usually involves locating frames on 16mm roll film cartridges, the unit can also supply lists of microfiche frames containing a specific type of information, 3M noted.

The input/output unit costs $20,500 and the software module $4,250. The Microdisc system itself costs about $67,000. Rental plans are also available from the firm at P.O. Box 33686, 55101.



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The S-Series Cassette is [illegible] high strength polystyrene. The [illegible] are molded and the slip sheets are pressed flat. Precision tape guides, perpendicular corner posts, and a spring foam pressure pad are featured. The same unbreakable polypropylene storage case is used to house the cassette. The S-Series achieves a high performance rating at a somewhat lower cost.



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In-House System Cuts Firm's T/S Costs Almost 75%

LOS ANGELES – When Union Oil Co. examined its outside time-sharing costs, it decided it had an opportunity to cut costs.

The analysis was right. An in-house system, installed the next year, cut per-hour time-sharing costs in half.

Now, three years later, per-hour costs are down an additional 25%. These savings are partially offset by increased communications costs, however.

Union Oil's computer services personnel estimate about three-quarters of the system's connect hours are used by far-flung departments and divisions to handle a range of economic, technical and scientific tasks.

The remaining time-sharing connect hours go to application program development and, to a small extent, improving the system's operation.

Union Oil users, anywhere from Texas to Alaska, can use computer terminals in their offices to get the answers they need from the system in the company's headquarters here. A combination of leased and dial-up telephone lines link the remote terminals to Los Angeles.

Union Oil's computer installation centers around an IBM System 370/168. It operates with IBM's Time Sharing Option (TSO) to interconnect the nearly 100 terminals used in remote locations, as well as those used by corporate headquarter departments.

Outside T/S Limiting

When time-sharing services were purchased from outside vendors, the answers an engineer or scientist could obtain were limited by the amount of company data on file with the particular service bureau with which he was linked. Now the in-house system enables users to reach necessary and relevant corporate information and data resources.

The exploration and producing groups were among the first in Union Oil to employ time-sharing services. Beginning about eight years ago, time-sharing was used to evaluate the economic potential of possible wildcat wells, extensions of existing oil fields, secondary recovery projects and other exploration and producing investment opportunities.

At first there were five terminals, located in the offices of the oil and gas operations and linked to a number of service bureaus. The memory capacity of the computers available through service bureaus was limited at that time.

The company, therefore, started out with a "slimmed down, minor version of the kind of economic evaluation program we really wanted," according to Charles H. Clark, manager of technical services in the Oil and Gas Division.

"We worked with the system for quite a while," Clark recalled, "and finally managed to achieve more in terms of economic evaluation than we had with batch processing. Eventually, our use of time-sharing proved so valuable that 30 terminals were put in field offices."

However, escalating costs, the lack of capacity to do the entire job and the inconvenience of having to maintain duplicate programs and libraries finally led to the installation of an in-house system.

Significant Contributions

Another use of the system became apparent in 1973 and 1974 when Union Oil, like other oil companies, received requests for information, as well as new regulations and decisions issued by the Federal Energy Administation.

"Time-sharing enabled us to respond quickly," said Thomas M. Ragland, manager of systems and programming for the Oil and Gas Division.

Time-sharing's contribution before 1973 was also significant, Ragland said. "It helped increase computer programmers' productivity by about 200%.

One program was developed in six months, instead of the estimated 18 months it would have taken without time-sharing, he said.

"We were able also to develop rapidly a new application for billing our joint-venture partners, who share the costs of operations with us," Ragland added.

"Now bills go out on the day a billing period closes and payments return sooner. With the recent high interest rates, the pay-off on this project was excellent," he said.

Ragland calculated the cost of programmers at about four times the cost of machines in any systems development work. "As a result, anything we can do to make them more effective – such as using time-sharing – is

(Continued on Page 40)



On a magical afternoon in August, a cheer went up at Vadic. Why the celebration? We shipped our 100,000th modem. It went to Addressograph-Multigraph.

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SECURITY PACIFIC OPTIMATION SERVICES

Cost of T/S Drops Almost 75% After Company Buys Own System

(Continued from Page 39)

well worth the expense."

Charles R. Gahr, manager of computer services, pointed out that the total connect time billed to users has increased from 1,000 hours when the in-house system was first installed to over 4,000 hours per month.

Gahr expects time-sharing usage to increase 25% – to about 5,000 hours per month – this year, and eventually to about 8,000 hours. Meanwhile, hourly rates to users are expected to drop somewhat in the future.

Much of the growth will come in the distribution area, Gahr predicted.

"Our exploration and producing groups have gone a long way in using computers for economic analysis, Our refining and manufacturing have also done much. And we have extensive experience in our refineries in using computers to solve problems.

Connect Time Billings Up

"But in distribution," Gahr noted, "we are learning constantly how to improve our operations through computer-based economic analysis. As the distribution and marketing picture changes – and as problems get more and more complex – I anticipate a sharp increase in time-sharing utilization by distribution planners and marketing personnel."

Union Oil's corporate planning unit is already an important time-sharing user. Warren H. Buell, manager of corporate planning services, told why.

"When the corporate plan and budget is presented to the executive committee, there are inevitably a great many questions about how the plan would be affected by changes in taxes, in prices and a wide variety of other factors," he said.

Answers Ready

"Often, we have anticipated the questions and have the answers ready. As for the few unexpected questions, time-sharing enables us to furnish the executive committee with answers in a matter of minutes – instead of hours or even days.

"In a complicated business like oil," Buell added, "where millions of dollars can depend on a single assumption – and decision making is exceedingly complex – that's a very helpful service to provide the decision makers."

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Series 300 Extends Forms-Handling Line Of Standard Register

DAYTON, Ohio – The Series 300 slitter/merger/imprinter (SM1) is the latest addition to the auxiliary continuous forms-handling equipment line of The Standard Register Co.

Depending on the optional features included, the Series 300 SM1 may be converted from its free-standing base unit, having a positive pinbelt forms-feeding control, into any one of seven different machines.

These include use as a simple margin slitter (Model 302) or as an imprinter of one-wide (Model 303) or two-wide forms (Model 305).

Works in Tandem

For use in tandem with a forms-bursting device, the unit is equipped with a Photocell Loop Control allowing synchronized operation of both devices at speeds up to 300 ft/min.

The SM1 device handles paper weights from 12- to 125 lbs at speeds varying from 80- to 300 ft/min, depending on the forms and function involved.

Prices range from $1,250 to $1,895 or $48- to $75/mo on a lease arrangement from the firm here in Dayton, 45401.

Device Protects DP Shops With Water-Cooled CPUs

ROCKVILLE, Md. – DP shops that use chilled water under raised floors to help cool their DP equipment may be interested in the Denco Model WD 2-10 water detection system.

The device's "continuous-element sensor" is said to be capable of detecting even minute quantities of water anywhere along its entire length. The unit costs $1,995 from the firm at P.O. Box 1442, 20850.

Invest in yourself this fall.

Announcing the EDP Seminar Series Fall Schedule

The world of EDP is caught up in a continuous revolution. It's only 24 years since the first business computer made its appearance, and we've gone from tubes, batch processing and single-site giants to multiprogramming, time sharing, data communications, giant minicomputers and hundreds of other technological innovations that were unheard of only recently. Keeping up with this revolution is difficult, to say the least. And that's why we've created the EDP Seminar Series.

The EDP Seminar Series gives you practical applications of the newest advances in computer management. What you learn will save you time and money, because each course is geared to practical dollars and sense application.

Remember, these are seminars, not lectures, and you'll be learning by doing in a shirtsleeve atmosphere. Workshops are an important feature of the Seminars, and round table discussions and shop talk luncheons complement the seminar presentations. The workbooks and course materials are yours to keep, so you'll always have a handy reference to all you've learned.

We've selected leading experts from around the country to guide each of our Seminars. They are highly accomplished specialists in their fields, experienced in presenting their techniques to industry and management. If you're involved in one of the areas shown, you should attend the EDP Seminar Series this fall. What you learn will benefit your company, your installation, and you.

Data Communications Course #1010 —Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

San Diego	**Plaza Int'l Hotel**	**Sept. 29-30**
New York	**St. Moritz**	**Oct. 13-14**
San Francisco	**Dunfey's Royal Coach**	**Oct. 20-21**
Dallas	**Hilton Inn**	**Nov. 10-11**
Miami	**Marriott Miami Beach**	**Nov. 17-18**

Data Communications Course #1020 —Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Miami	**Holiday Inn Airport Lakes**	**Dec. 1-3**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

New York	**Summit Hotel**	**Oct. 22-24**
San Francisco	**Hyatt Regency San Francisco**	**Nov. 12-14**
Chicago	**Hyatt Regency O'Hare**	**Nov. 19-21**

How to Draft Effective Legal Agreements

This one-day seminar is a complete workshop for non-legal, technical people who may be called upon to draft legal agreements for their company. Also led by Roy Freed, this seminar covers a variety of formal agreements, their structure and the legal factors involved. You'll have all the basic skills necessary to write legal agreements, and you'll be able to spot items that really require the attention of lawyers.

Cost for the seminar, including luncheon and a complete workbook on the subject, is $135.

New York	**St. Moritz**	**Oct. 8**
Boston	**Sheraton**	**Oct. 15**

Data Base Design

Given in association with Leo J. Cohen and Performance Development Corporation, this three-day seminar is a package-independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimum File Organization/Indexing Techniques, File Integration, and much more.

Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300.

New York	**St. Moritz**	**Sept. 22-24**
Denver	**Denver Hilton**	**Dec. 1-3**

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

New York	**Summit Hotel**	**Sept. 29-30**
Wash., D.C.	**Marriott at Wash. Int'l. Airport**	**Oct. 20-21**
Chicago	**Hyatt Regency O'Hare**	**Oct. 27-28**
San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams.

Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

New York	**St. Moritz**	**Oct. 6-7**
San Francisco	**Berkeley Marriott**	**Nov. 10-11**

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As Result of Privacy Act

Exotic Security Devices Sure to Be Part of DP Future

By Ralf Brent
Special to Computerworld

NEW YORK – A new set of government regulations and guidelines is due to go into effect at the end of this month that will materially change the security environment in which computers will be operated.

The implications of the Privacy Act of 1974 particularly apply to systems containing sensitive personal data and proprietary information which might be deemed secret or confidential.

As with most legislation, there are unforeseen results which have cropped up, resulting in a whole new set of restrictions and problems with which most computer people have not had to deal until now.

If these restrictions and measures to comply with them are not already the talk of the industry, they soon will be, as manufacturers, distributors and installers of various security devices of a quite exotic nature begin to aggressively sell their wares.

NBS Efforts

The systems and software section of the National Bureau of Standards (NBS) has already published a set of guidelines and is offering lists of workshops and seminars.

It has also recommended that four papers published by the Computer and Business Equipment Manufacturers Association (Cbema) be placed on the reading list of computer executives and security directors.

In those industries with sensitive government contracts, the government apparently intends to prescribe just how rigid security must be. And it seems that before too long, certain types of devices will be finding their way into the government handbooks for computer security.

According to NBS publications, there are about 130,000 computers in place in the country representing a physical asset value of almost $30 billion. "There is no way to place a value on the millions of data files and programs used by these machines or on the value of the services performed by these machines. Companies have nearly been put out of business by manipulation of their data files," these pamphlets stated.

"Computer-services usually operate as far as possible according to guidelines and instruction provided by their customers; special care such as the use of a dedicated computer may be provided for users if requested and paid for," these reports said.

And then comes the portent for the future as far as government intervention in security procedures are concerned: "Eventually the requirement for computer security may create specialized computer facilities which are certified to be secure for specified purposes."

"Certified" and "specified" are not imprecise terms, but words which definitely imply that, at some point, the prospect of government standards and prescribed solutions to computer security will become the order of the day.

The new techniques which seem called for in the government's new computer security guidelines have now gone far beyond locks and keys, dial combinations and guards.

Photo badges, even with electronically coded information about the bearer, seem already too simplistic. Embossed and punched identification cards, which can all too easily be lost, borrowed, stolen or duplicated, also will no longer fill the bill, at least not without additional verification that the person carrying the card is actually the one to whom it was orignally issued.

All indications, as uncovered in a study by John Moynahan & Co., point to a combination of key cards and encoded biometric data or computer-stored memory concerning the individual.

Those who in the future will be permitted to enter a particular data center and use certain portions of data files will carry special cards designed to be slipped into sophisticated "readers" installed on walls, doors or actually attached to the computer consoles.

The biometric measurements at

(Continued on Page 43)

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Key-to-Disk Reduces Moving Company's Staff, Shifts

GLENDALE, Calif. – Replacing keypunches with key-to-disk had a marked effect on Bekins Moving and Storage Co.: The data entry department was able to cut its staff by a third and go from three shifts to two.

Bekins performed a feasibility study on staying with keypunches vs. going to key-to-disk, Boris Popin, operations manager, recalled. The study looked at the current costs of cards and people and the amount of work a person can do at a keypunch or keystation, he said.

The DP shop's responsibilities were growing rapidly and the volume of punch cards was already "just astronomical," Popin said. "On just one financial system, we were creating 100,000 card records a month."

The study found key-to-disk better able to cope with further growth, he said.

Bekins bought an Entrex System 480 with 10 keystations because of the "software, the disk, the keyboards and the price," Popin said.

Once prepared, the data runs on a Burroughs B3700 CPU.

Since the key-to-disk system was installed in February, Bekins has reduced its data preparation staff from 27 to 18, all through attrition, Popin noted. The firm also dropped its third shift.

Additionally, the firm had spent an average of $2,065/mo on outside keypunch services between January 1974 and August 1974. Since that August, the company has had no keypunch work done outside its own shop.

Key-to-disk itself gives the user about a 20% productivity gain because it avoids "the manual slowdown" of handling cards and offers formatting of data, validation and other useful features, Popin explained.

Popin was unworried about what might happen if the key-to-disk controller went down. "We have about four other users in the area, plus Entrex, that we could go to in case the system controller failed," he said.

The company has copies of its key-to-disk software ready for such an emergency, he added.

Popin said he has not experienced any downtime on the $67,000 system other than two hours of preventive maintenance a month.

Exotic Security Devices in Future

(Continued from Page 42)

present fall into several categories: hand geometry, fingerprints, voice prints and signature impressions. The "Computer Security Guidelines for Implementing The Privacy Act of 1974," prepared by the NBS, stated: "There are three categories of methods by which a person's identity may be established for the purpose of allowing access to an information system.

"The methods, which can be applied singly or in combination, are based on: (1) Something the person knows (a code word or number), (2) Something the person has (a key card or key) (3) something the person is."

This third category, the guidelines said consists of characteristics, such as a person's appearance, fingerprints, hand geometry, voice or signature."

Referring to unique physical keys, the pamphlet said: "Such physical items, however, are easily lost, stolen or counterfeited."

Again quoting the "Executive Guide" on biometric data: "These biometric methods promise high reliability and accuracy, but most techniques are still in the research stage."

However, the Identimat Co. has installed its hand-geometry machines in over 100 locations. Another biometric device, Fingerscan, utilizes fingerprints, which are compared against coded information previously recorded.

Other biometric measurement devices include "voice print" techniques which compare the human characteristics of a person's speech which are unique. The device must interface with a certain dedicated section of the computer's storage capacity.

Veripen's signature-based system utilizes an electronic ballpoint pen hooked to a computer. The processor compares pressure of the pen and time taken for the formation of each letter of a person's signature with previously recorded data.

The Federal Reserve System is reported to be testing some of these devices; no findings have yet been made, however, and no recommendations have been forthcoming.

Brent is senior vice-president at John Moynahan & Co., New York City.

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Traffic Court System Triples City's Parking Ticket Revenues

PITTSBURGH, Pa. – Pittsburgh's conversion to a central, large-scale DP facility has had a notable effect on the city's Traffic Court – revenue collections tripled in four years, even though the number of tickets issued rose only 50%.

Back in 1968, Traffic Court operated with a manual card file. Copies of the parking tickets were filed by number. When a ticket was paid, the copy was pulled.

When a copy was missing from the file, it was assumed the ticket was paid. There was no particular system for tracking down scofflaws.

Then, in 1969, a new administration with a heavy commitment to DP took office. A staff was assembled under the Office of the Mayor and, the following year, an NCR Century 200 computer was installed to take on jobs from all departments.

Before long, the workload became overwhelming and, by the end of the year, a second Century 200 was added.

For economic reasons, the two Century 200s were replaced in July 1973 by a Century 300 with 256K words of memory, six dual disk units, four magnetic tape drives, two printers and seven CRT terminals.

With this system, Traffic Court has been able to capture the details of every parking ticket on the magnetic disk file. At any one time, there are about 50,000 parking tickets outstanding.

After the tickets are written, copies are brought to Traffic Court, where they are batched and keypunched for entry onto the computer file. The stored data includes ticket number, automobile license number, vehicle make, type of violation, time and location.

The computer's unpaid ticket file is on-line to four CRT terminals, three in Traffic Court and one in the Police Communications Center. When a ticket is paid, the number and fine amount are keypunched for entry into the computer that night to erase the item from the file. The unpaid ticket file is therefore current to the previous day's transactions.

For all tickets not paid in a week, the computer automatically prepares a magnetic tape containing each vehicle's license number. The tape is sent to the state motor vehicle bureau, where the owners' names and addresses are picked up from the state's computer files.

The tape is returned to Pittsburgh where the names and addresses are read into the Century 300 and added to the unpaid ticket file.

System Prints Summonses

Using this name and address information, the computer prints summonses that are mailed to the vehicle owners. Every time a summons is issued, court costs are added to the fine and these are both printed on the notice and posted to the unpaid ticket file.

If a summons is not returned in 10 days, the computer prints a warrant, again adding court costs to it and the on-line file. The warrant is sent to the violator and a constable.

In most cases, the arrest warrants bring almost immediate results. When fines are paid in Traffic Court, the clerks enter the ticket and license numbers through the CRT terminals. The computer searches the file and displays the data on the unpaid ticket.

In a cross-check, the computer also scans the file for the vehicle license numbers and, when there are other unpaid tickets charged to those cars, it will respond: "There are additional tickets."

To find out what these additional tickets are, the clerks make another inquiry through the terminals.

It is almost impossible for a violator to pay one fine and not be nailed for other outstanding tickets. It is possible for a violator not to answer a summons or a warrant, but if he is an habitual offender – 25 or more tickets – and has not paid his fines, the computer adds his vehicle's license number to an updated list for distribution to the police.

Then, if the car is spotted on the street, it is towed away and can be recovered only after the fines and costs have been paid. The warrant for a single violation also gives the police authority to tow away the vehicle.

With access to the same computer information, the terminal in the Police Communications Center is used to answer inquiries radioed in from patrol cars and meter maids who have spotted what they think are scofflaw vehicles.

Why pay good money for an 80-column printer if all it can print is 80 columns?



Our new 80-column Model 306C prints 80...96...and 132 columns per line – by simply flicking a switch or by software command.

Our 80-column Model 306C is unique. It's a 100 char/sec. 80-column printer. A 120 char/sec. 96-column printer. And a 165 char/sec. 132-column printer. You can have any two in the same machine – with column width controlled by software command or the flick of a switch. Ideal for hard-copy output. *And especially in receive-only communications to 1200 baud.*

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Transaction Processing:

Honeywell's Transaction Driven System can give you a big jump on your competition.



It can make your people more productive — give you more control over your business.

Transaction processing — putting people in touch with up-to-the-minute data so they can do their jobs more quickly, accurately, and efficiently. This spontaneous style of information processing puts the power of a central computer into the mainstream of business activity. Information inquiries and entries are made through an onsite terminal. Then, rapid transmission over communication lines gets the information where it's needed, when it's needed — for decision making, cost control, better customer service.

Transaction processing is one of the many computing dimensions available with Honeywell's Series 60 Level 66 systems. These are systems made to meet your present and future requirements. The modular design of Level 66 hardware allows tailored growth from your first large-scale system all the way to a superpower computer. Start with the Level 66 system that meets your current price-performance needs. Then add hardware as you need it, and upgrade without reprogramming. All Level 66 systems use one version of Honeywell's General Comprehensive Operating Supervisor (GCOS). All user software and data files are compatible on all Level 66 systems.

TDS–our newest interactive software

Honeywell's newest software for interactive processing is the Transaction Driven System (TDS). Operating within the GCOS operating software, TDS offers advantages in processing and implementation:

Timeliness– Information is current. Each transaction triggers immediate updating of the online data base.

Responsiveness – Transactions are processed as they occur, in direct response to the sender's inquiry or instructions.

Protection– Stored data is guarded against erroneous updating, or loss, through Honeywell's data base management system, Integrated Data Store.

Flexibility– TDS can run concurrently with local batch processing, remote job entry, and time sharing. The user provides the variables to tailor the system, and TDS supplies a COBOL-like language to simplify the programming.

Speed– Separate management of the network and the central system expedites processing. Honeywell's Network Processing Supervisor and DATANET Front-End Network Processor handle all communications between terminals and the central system. GCOS and the Level 66 central system handle the information processing.

Simplicity– It's quick and easy for anyone familiar with a keyboard or terminal to learn how to retrieve and update information with TDS.

Economy– Design and implementation costs are reduced by easy-to-use interfaces for the whole system – operating system software, data base management, and terminals.

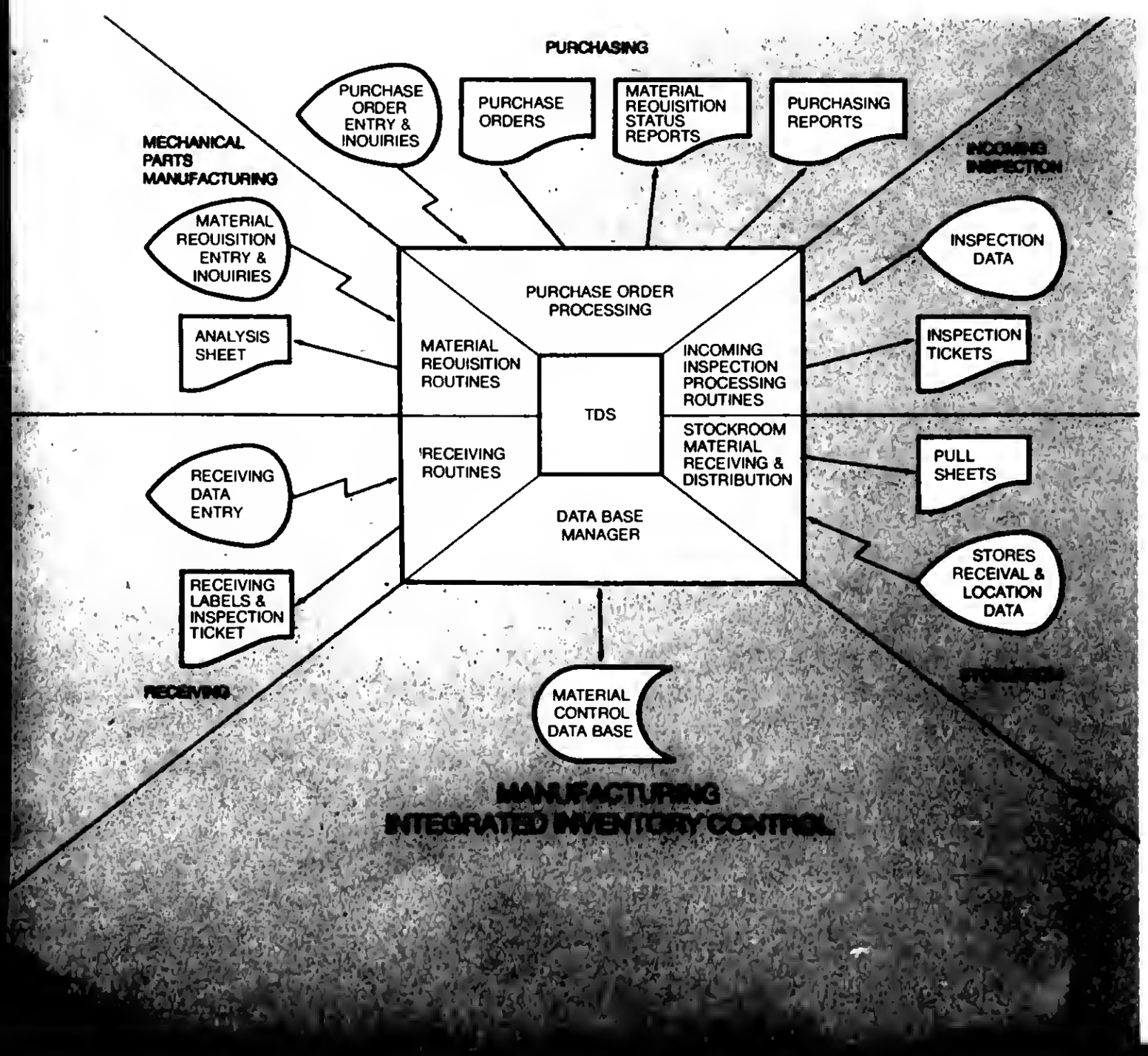


How TDS is used

When your business requires quick response – in order processing, inventory control, or management-oriented inquiries – TDS is an efficient tool to meet that requirement.

Insurance companies, hospitals, brokerage firms and airlines are typical industries that need to maintain the high quality of customer service and operational efficiency that TDS can provide.

Manufacturers and distributors use TDS to improve inventory management and online order entry. Banks use TDS to speed teller operations and tie their remote locations into the central computer.

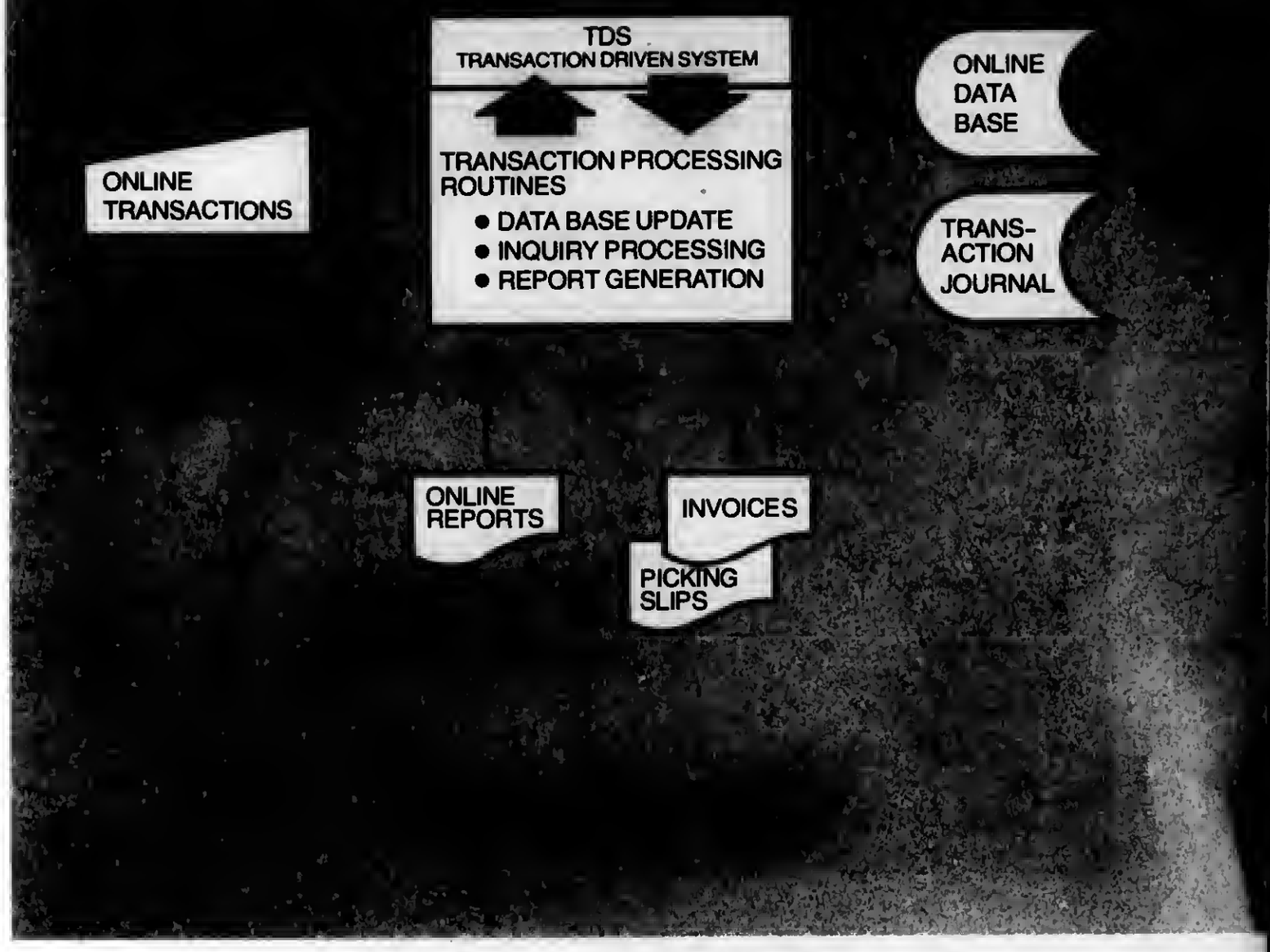




...In Manufacturing

A high-technology electronics equipment manufacturer uses TDS to organize and control manufacturing inventories. By integrating and managing critical functions in the inventory cycle, such as controlling backorders, issuing work authorizations, and generating internal purchase orders, TDS helps minimize the problems surrounding the flow of materials.

At work stations throughout the company — purchasing, incoming inspection, receiving — employees enter data at visual display terminals. All input data is edited as it is entered. Errors can be detected and corrected immediately by the originator. Once information has been entered into the data base, it is immediately accessible to all the work stations. As a result, backorders can be monitored more closely, work authorizations are easy to trace, and purchase orders can be printed automatically.



...In Distribution

A large regional drug distributor uses TDS for online order entry and accounts receivable. Visual display terminals at key points in the distribution cycle gather the information at its source.

Input begins with customer orders, written or by telephone. Operators enter the orders on terminal keyboards. TDS automatically verifies and checks product item and quantity-on-hand. Discounts, due dates, and bonuses are established, and the customer is advised of any promotional offerings.

TDS follows up through the order processing activities, immediately updating online the product and customer files, automatically preparing backorders, purchase orders, and shelf-replenishment orders, and accumulating order data for analysis.

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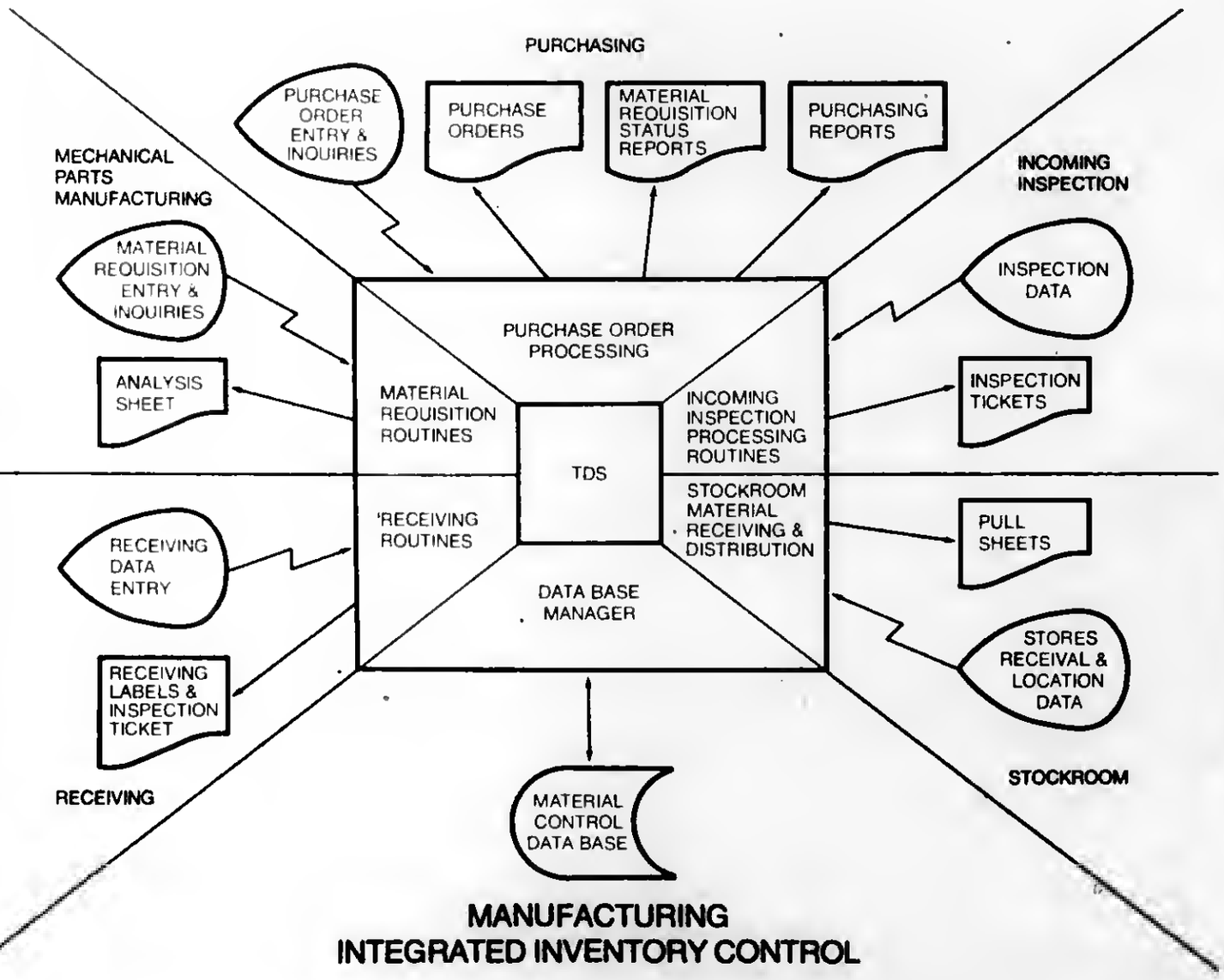


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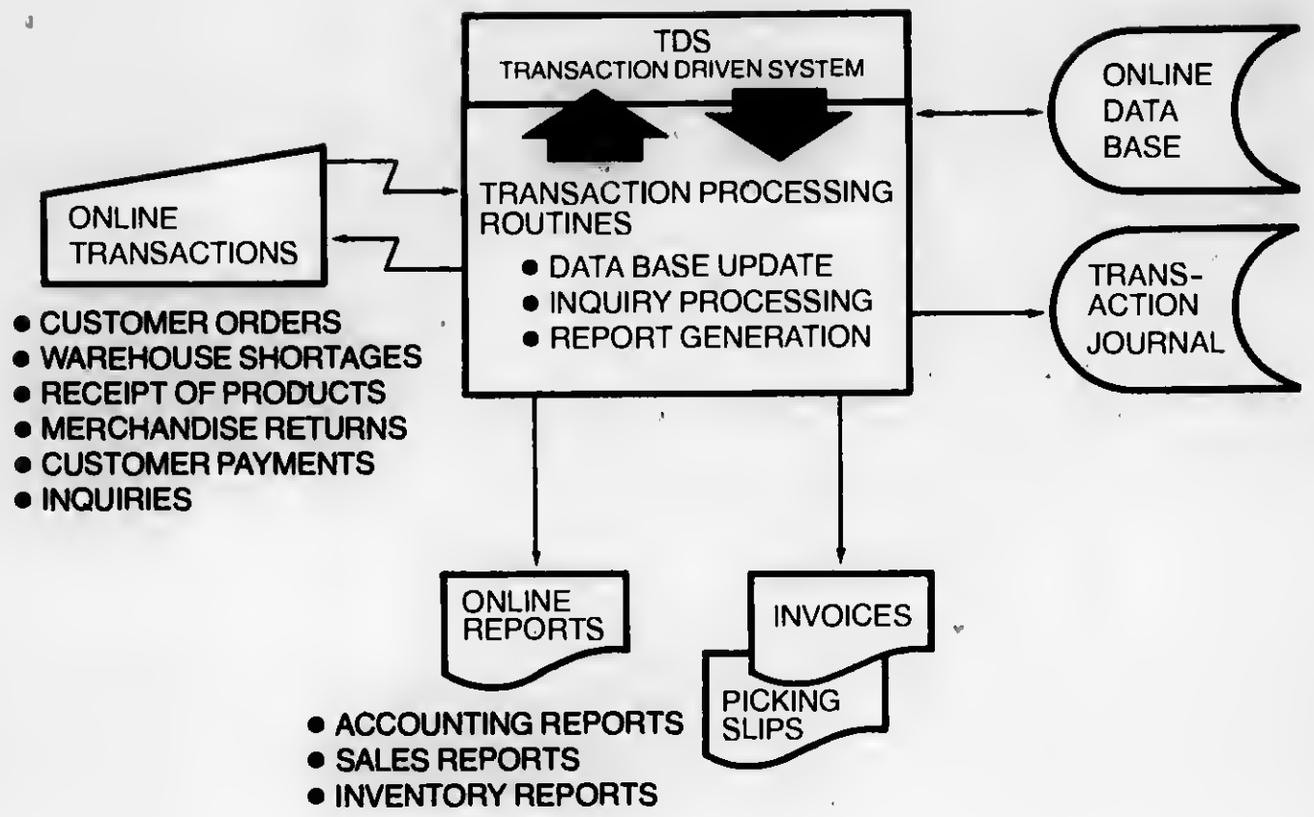
MANUFACTURING
INTEGRATED INVENTORY CONTROL



...In Manufacturing

A high-technology electronics equipment manufacturer uses TDS to organize and control manufacturing inventories. By integrating and managing critical functions in the inventory cycle, such as controlling backorders, issuing work authorizations, and generating internal purchase orders, TDS helps minimize the problems surrounding the flow of materials.

At work stations throughout the company — purchasing, incoming inspection, receiving — employees enter data at visual display terminals. All input data is edited as it is entered. Errors can be detected and corrected immediately by the originator. Once information has been entered into the data base, it is immediately accessible to all the work stations. As a result, backorders can be monitored more closely, work authorizations are easy to trace, and purchase orders can be printed automatically.



PHARMACEUTICAL DISTRIBUTION
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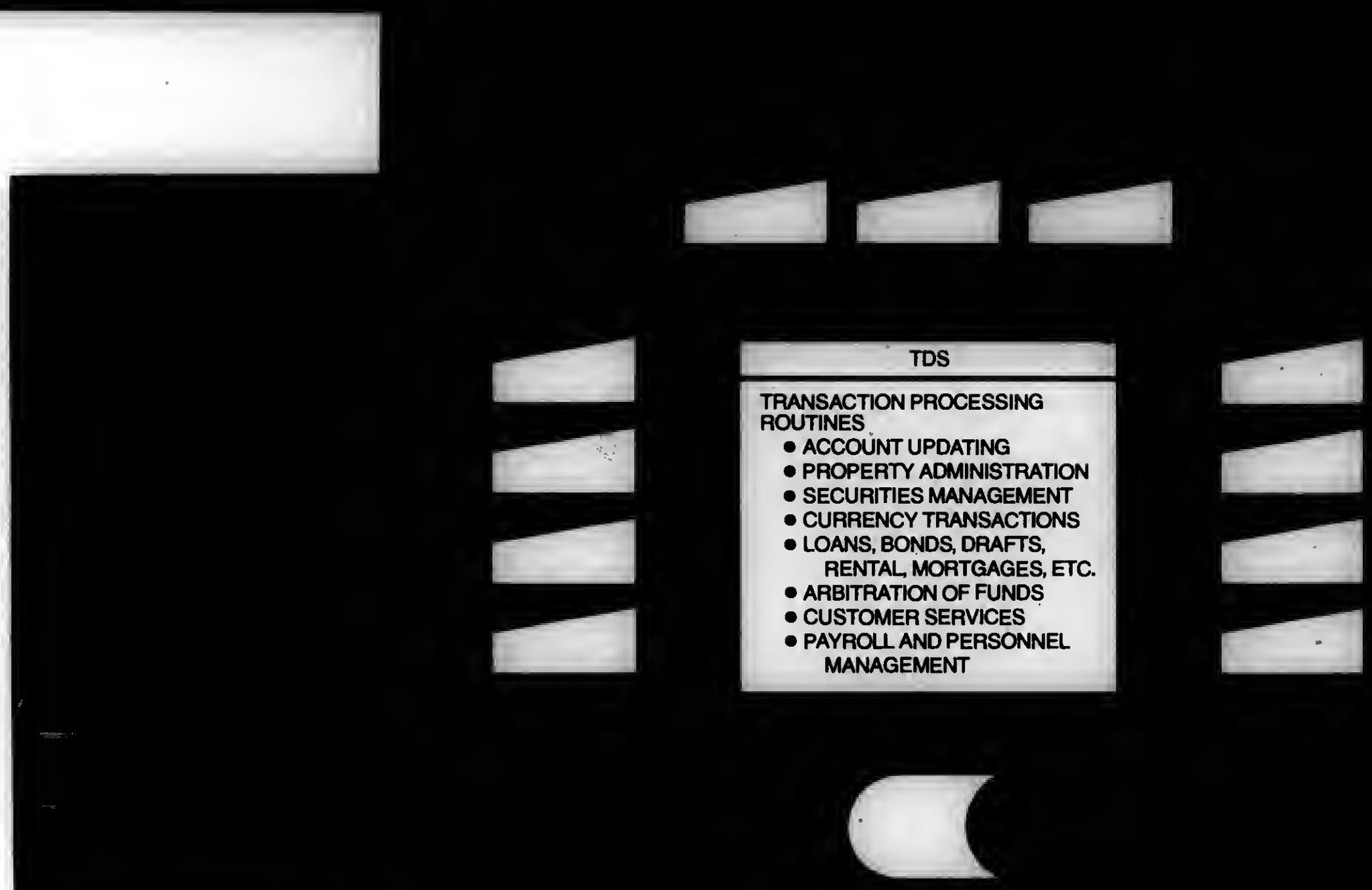
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...In Banking

A major commercial bank uses TDS for account updating and currency and bond transactions, as well as for loan and mortgage accounting. TDS speeds file inquiries and such complex calculations as securities evaluations, financial ratio analysis, and amortizations. The system links an online central computer to a network serving nearly 200 terminals, 1100 employees, and 33 branch offices.

TDS helps the bank keep its document production, circulation, and inquiries to a minimum, giving employees more time to do their jobs. And since the network shares a common data base, all personnel can obtain necessary information quickly and economically.

Transaction processing plays an important role at the teller windows. TDS enables tellers to record customer account transactions easily and update the data base. The teller or operator simply types in a message to begin processing a transaction. Service operations — check approvals, holds, or stop payments — are also handled by TDS. In a typical check transaction, the check is accepted or rejected immediately on the basis of the account status.

TDS and Level 66 Can Help You Improve Your Business, Too.

Get more for your investment. Let Honeywell's TDS and multi-dimensional computer power improve information management and apply new and advanced techniques. Level 66 systems have all the general purpose capabilities of any large system, *plus* local batch, remote job entry, time sharing, and transaction processing.

Level 66 systems with TDS make online transaction processing practical for a wide variety of industries and applications. Flexibility, very high performance, fast recovery and restart capabilities, efficient terminal and data base management, and easy-to-use concepts make TDS one of the most advanced systems for transaction processing in the industry today.

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I'm interested in Transaction Processing. Tell me more.

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Order No. AS 53

Mini Bits

Tape Drive for DG Nova Requires No Formatter

BOULDER, Colo. – The Model 103D interface system provides 1/2-in. industry-compatible tape storage for Data General Nova computers at a price comparable with cassette and paper tape systems, according to its developer, Rela Designs, Inc.

The interface uses programmed I/O transfers rather than the data channel, resulting in fewer components than in commonly available interfaces. The interface occupies one card slot in the Nova.

No formatter is required since this function is performed by the software provided. Special connectors plug directly into the Nova backplane, making installation simple, the vendor said, adding it will provide complete programming support for the system.

The interface circuit board is priced at $900 and tape drives (Pertec 5000, 7000 and 8000s) range from $2,400 to $3,800. The MSOS operating system (including Basic driver) is $700.

The firm is at 1322 Arapahoe, 80302.

BDSC Offers Business Mini

PALO ALTO, Calif. – Business Data Systems of California, Inc. (BDSC) has introduced the BDS 0/100 business minicomputer system which consists of a 16K-word CPU, 12M bytes of fixed disk, a 24 by 80 character CRT and a 100 line/min printer.

A variety of equipment options are offered, including application libraries designed to tailor the BDS 0/100 for individual end-user requirements.

All system components are enclosed and tested in a desk configuration.

The BDS 0/100 utilizes a disk operating system called BDSOS and features Exbasic, an extended Basic that supports up to eight users.

The BDS 0/100 is available in 30 to 45 days and is priced at $17,500 in quantities of 15. The firm is at 260 Sheridan Ave., Suite 100, 94306.

Pryor Pak Holds S/32 Supplies

CHICAGO – The Pryor Pak 32 from Pryor Corp. is a mixed group of supply items in one package for the IBM System/32 user.

Packaged in one United Parcel-shippable box, the Pak contains 30 diskettes, 1,500 stock forms, five binders and six printer ribbons. It sells for $232.

The box can be reused for storage if desired, the firm said from 400 N.Michigan Ave., 60611.

Slated for Nov. 17-19

Major Conference Set on Applications

WASHINGTON, D.C. – A major conference on minicomputer applications in government, business and other organizations will be presented by the American Institute of Industrial Engineers (AIIE) here at the Sheraton Beltway Convention Center on Nov. 17-19.

Featured conference speakers include:

- Walter L. Anderson, associate director for the Automated DP Financial and General Management Studies Division of the U.S. General Accounting Office (GAO).
- Kenneth Harple, president of Modular Computer Systems.
- Kenneth Olsen, president of Digital Equipment Corp.
- Theodore D. Puckorius, commissioner of the General Services Administration's Automated Data and Telecommunications Service.

The conference is designed to promote effective minicomputer applications by attendees, the AIIE said. Successful minicomputer applications experience and "lessons learned" by users will be presented in overviews and case study workshops.

The new GAO study recommending expanded minicomputer usage in government agencies will be highlighted at the conference. Other plenary sessions presenting overviews of government and business minicomputer usage will focus on minis as extensions of centralized data processing, stand-alone, general-purpose systems, networks and dedicated systems.

Concurrent workshops are scheduled to present in-depth case studies of current successful minicomputer applications. Case presentations will be followed by panel discussions involving additional user executives and conference attendees.

Scheduled workshops include:

- Stand-alone, general-purpose minicomputers.
- Minicomputers as extension of central data processing.
- Minicomputer networks.
- Intelligent terminals and minicomputers: data handling applications.
- Dedicated minicomputers: innovative applications.

On the final day of the conference, concurrent panel discussions are scheduled on minicomputer procurement, with one panel covering procurement by government agencies, another panel procurement by business and other institutions.

Procurement panel presentations and discussion will encompass check lists used before and after vendor selection. Special emphasis will be placed on effective follow-through with vendors after purchase.

The workshop on "Stand-Alone, General-Purpose Minicomputers" will cover minicomputers as an approach to decentralized data processing for the large user or as a total service for the smaller user. Applications software may be provided by central data processing, local programming or turnkey hardware/software acquisition.

The workshop on "Minicomputers as an Extension of Central Data Processing" will cover systems combining a large central computer with minicomputers or intelligent terminals having limited local processing capability.

The "Minicomputer Networks" workshop will cover systems involving distributed processing power without the use of a large central computer – those based on minicomputers alone.

The "Intelligent Terminals and Minicomputers" workshop will focus on data handling applications, with standard or locally controlled programming, for transmission to central data bases. The "Dedicated Minicomputers" workshop will survey minicomputers in a one-application environment, including complete hardware/software systems designed for standardized multiple installations.

AIIE Seminars can be reached through P.O. Box 25116, Los Angeles, Calif. 90025.

Write Now

October is data entry month at *Computerworld*. And the Special Report in the Oct. 29 issue will cover the wide range of data entry with heavy emphasis on remote data capture.

The use of minicomputers is becoming a key part of the data entry function, and stories of successful installations will be a major feature of our special report.

You don't have to be a professional writer to tell of your installation or application in CW. Just send us a three- or four-page, typed, double-spaced note and explain what you had before, what you have now, why you changed, the advantages of the new system and just how effective the change was from a cost- or time-saving point of view. Our team of editors will take it from there. CW is at 797 Washington St., Newton, Mass. 02160.

Apodictics Links Line Printer to S/3 Model 16...

ANN ARBOR, Mich. – Apodictics, Inc. has interfaced a 200- to 760 line/min printer to the IBM System/3 Model 6 computer.

Designated the System/3 Fast Printer, it can also be used as a second printer on System/3 models 8, 12 and 15. No additional IBM hardware or software is needed and the size of the supervisor is not changed, the company said.

RPG program output may be directed to either the standard IBM printer or the Fast Printer under program or operator control. Most system logging, utility program and RPG compiler outputs can also be directed to the Fast Printer when it is attached to a model 6 or 10.

Special custom software is available for unique printer applications on all models of the System/3, the company added.

The printer handles multipart forms and has 132 print positions and 64 characters. Additional features include full line buffering and electronic forms control.

Options include special character sets, upper/lower case, boldface-accented characters and 48- or 96- character sets.

Prices range from $8,300 for the 200 line/min, 64-character printer to $14,900 depending upon options. Apodictics is at 321 S. Main St., P.O. Box 2109, 48106.

...And Paper Tape Unit, Too

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Utilizing the Remex 6375 reader/punch, the system provides the System/3 user with a read speed of 300 char/sec. and a punch speed of 75 char./sec using standard 8-channel tape or 6-track typesetter tape.

The system attaches directly to all models of the System/3 and no additional IBM hardware or software is required. Complete software support is provided which allows the user to program the tape reader/punch as easily as the MFCU, the firm added.

Automatic Conversion

Automatic Ascii-to-Ebcdic conversion is done in the software and an option is included which allows the programmer to specify any code conversion table desired or read and punch straight Ebcdic.

The reader/punch system is priced at $4,900. The 300 char./sec reader is available as a separate system for $3,585, the firm said from 321 S. Main St., 48106.

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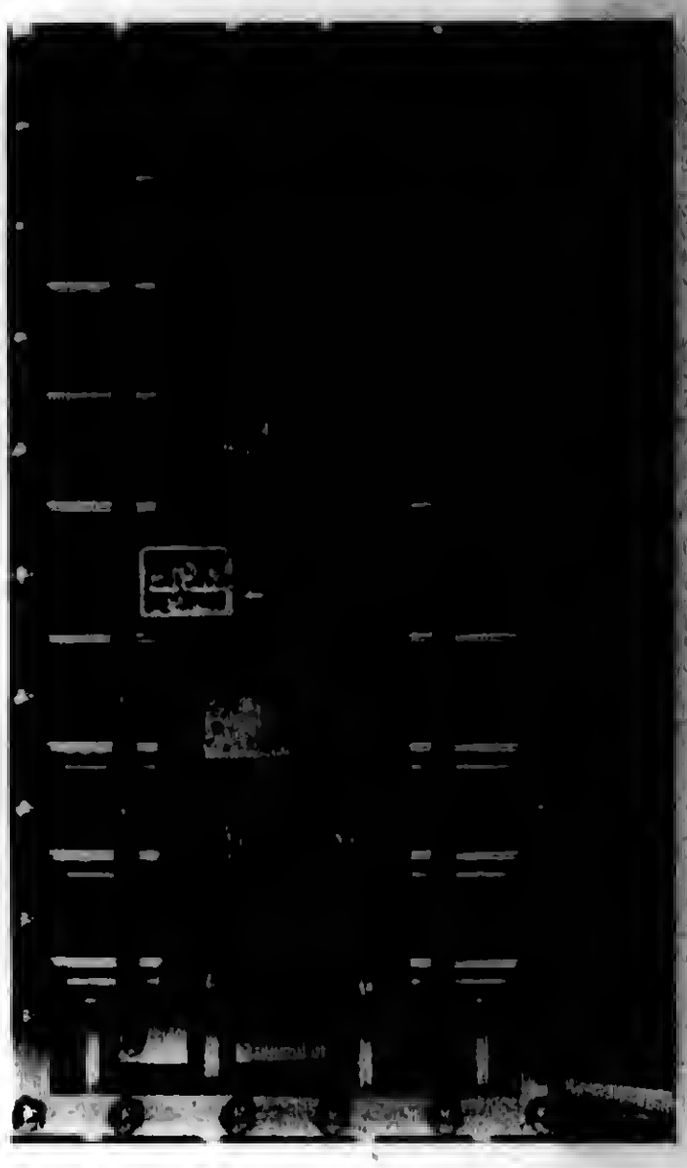
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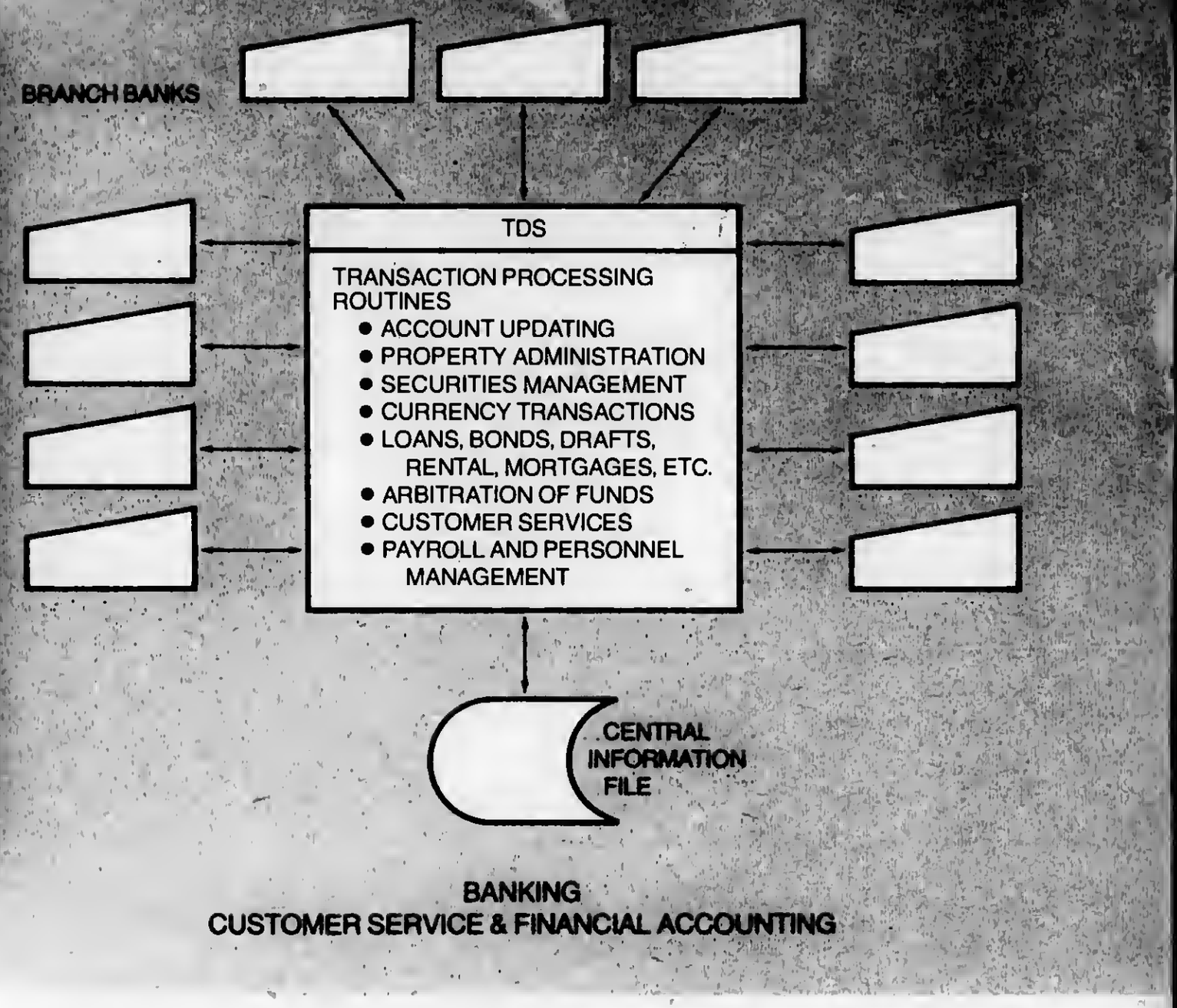
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...In Banking

A major commercial bank uses TDS for account updating and currency and bond transactions, as well as for loan and mortgage accounting. TDS speeds file inquiries and such complex calculations as securities evaluations, financial ratio analysis, and amortizations. The system links an online central computer to a network serving nearly 200 terminals, 1100 employees, and 33 branch offices.

TDS helps the bank keep its document production, circulation, and inquiries to a minimum, giving employees more time to do their jobs. And since the network shares a common data base, all personnel can obtain necessary information quickly and economically.

Transaction processing plays an important role at the teller windows. TDS enables tellers to record customer account transactions easily and update the data base. The teller or operator simply types in a message to begin processing a transaction. Service operations — check approvals, holds, or stop payments — are also handled by TDS. In a typical check transaction, the check is accepted or rejected immediately on the basis of the account status.

TDS and Level 66 Can Help You Improve Your Business, Too.

Get more for your investment. Let Honeywell's TDS and multi-dimensional computer power improve information management and apply new and advanced techniques. Level 66 systems have all the general purpose capabilities of any large system, *plus* local batch, remote job entry, time sharing, and transaction processing.

Level 66 systems with TDS make online transaction processing practical for a wide variety of industries and applications. Flexibility, very high performance, fast recovery and restart capabilities, efficient terminal and data base management, and easy-to-use concepts make TDS one of the most advanced systems for transaction processing in the industry today.

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Mini Bits

Tape Drive for DG Nova Requires No Formatter

BOULDER, Colo. – The Model 103D interface system provides 1/2-in. industry-compatible tape storage for Data General Nova computers at a price comparable with cassette and paper tape systems, according to its developer, Rela Designs, Inc.

The interface uses programmed I/O transfers rather than the data channel, resulting in fewer components than in commonly available interfaces. The interface occupies one card slot in the Nova.

No formatter is required since this function is performed by the software provided. Special connectors plug directly into the Nova backplane, making installation simple, the vendor said, adding it will provide complete programming support for the system.

The interface circuit board is priced at $900 and tape drives (Pertec 5000, 7000 and 8000s) range from $2,400 to $3,800. The MSOS operating system (including Basic driver) is $700.

The firm is at 1322 Arapahoe, 80302.

BDSC Offers Business Mini

PALO ALTO, Calif. Business Data Systems of California, Inc. (BDSC) has introduced the BDS 0/100 business minicomputer system which consists of a 16K-word CPU, 12M bytes of fixed disk, a 24 by 80 character CRT and a 100 line/min printer.

A variety of equipment options are offered, including application libraries designed to tailor the BDS 0/100 for individual end-user requirements.

All system components are enclosed and tested in a desk configuration.

The BDS 0/100 utilizes a disk operating system called BDSOS and features Exbasic, an extended Basic that supports up to eight users.

The BDS 0/100 is available in 30 to 45 days and is priced at $17,500 in quantities of 15. The firm is at 260 Sheridan Ave., Suite 100, 94306.

Pryor Pak Holds S/32 Supplies

CHICAGO – The Pryor Pak 32 from Pryor Corp. is a mixed group of supply items in one package for the IBM System/32 user.

Packaged in one United Parcel-shippable box, the Pak contains 30 diskettes, 1,500 stock forms, five binders and six printer ribbons. It sells for $232.

The box can be reused for storage if desired, the firm said from 400 N.Michigan Ave., 60611.

Slated for Nov. 17-19

Major Conference Set on Applications

WASHINGTON, D.C. – A major conference on minicomputer applications in government, business and other organizations will be presented by the American Institute of Industrial Engineers (AIIE) here at the Sheraton Beltway Convention Center on Nov. 17-19.

Featured conference speakers include:

- Walter L. Anderson, associate director for the Automated DP Financial and General Management Studies Division of the U.S. General Accounting Office (GAO).
- Kenneth Harple, president of Modular Computer Systems.
- Kenneth Olsen, president of Digital Equipment Corp.
- Theodore D. Puckorius, commissioner of the General Services Administration's Automated Data and Telecommunications Service.

The conference is designed to promote effective minicomputer applications by attendees, the AIIE said. Successful minicomputer applications experience and "lessons learned" by users will be presented in overviews and case study workshops.

The new GAO study recommending expanded minicomputer usage in government agencies will be highlighted at the conference. Other plenary sessions presenting overviews of government and business minicomputer usage will focus on minis as extensions of centralized data processing, stand-alone, general-purpose systems, networks and dedicated systems.

Concurrent workshops are scheduled to present in-depth case studies of current successful minicomputer applications. Case presentations will be followed by panel discussions involving additional user executives and conference attendees.

Scheduled workshops include:

- Stand-alone, general-purpose minicomputers.
- Minicomputers as extension of central data processing.
- Minicomputer networks.
- Intelligent terminals and minicomputers: data handling applications.
- Dedicated minicomputers: innovative applications.

On the final day of the conference, concurrent panel discussions are scheduled on minicomputer procurement, with one panel covering procurement by government agencies, another panel procurement by business and other institutions.

Procurement panel presentations and discussion will encompass check lists used before and after vendor selection. Special emphasis will be placed on effective follow-through with vendors after purchase.

The workshop on "Stand-Alone, General-Purpose Minicomputers" will cover minicomputers as an approach to decentralized data processing for the large user or as a total service for the smaller user. Applications software may be provided by central data processing, local programming or turnkey hardware/software acquisition.

The workshop on "Minicomputers as an Extension of Central Data Processing" will cover systems combining a large central computer with minicomputers or intelligent terminals having limited local processing capability.

The "Minicomputer Networks" workshop will cover systems involving distributed processing power without the use of a large central computer – those based on minicomputers alone.

The "Intelligent Terminals and Minicomputers" workshop will focus on data handling applications, with standard or locally controlled programming, for transmission to central data bases. The "Dedicated Minicomputers" workshop will survey minicomputers in a one-application environment, including complete hardware/software systems designed for standardized multiple installations.

AIIE Seminars can be reached through P.O. Box 25116, Los Angeles, Calif. 90025.

Write Now

October is data entry month at *Computerworld*. And the Special Report in the Oct. 29 issue will cover the wide range of data entry with heavy emphasis on remote data capture.

The use of minicomputers is becoming a key part of the data entry function, and stories of successful installations will be a major feature of our special report.

You don't have to be a professional writer to tell of your installation or application in CW. Just send us a three- or four-page, typed, double-spaced note and explain what you had before, what you have now, why you changed, the advantages of the new system and just how effective the change was from a cost- or time-saving point of view. Our team of editors will take it from there. CW is at 797 Washington St., Newton, Mass. 02160.

Apodictics Links Line Printer to S/3 Model 16...

ANN ARBOR, Mich. Apodictics, Inc. has interfaced a 200- to 760 line/min printer to the IBM System/3 Model 6 computer.

Designated the System/3 Fast Printer, it can also be used as a second printer on System/3 models 8, 12 and 15. No additional IBM hardware or software is needed and the size of the supervisor is not changed, the company said.

RPG program output may be directed to either the standard IBM printer or the Fast Printer under program or operator control. Most system logging, utility program and RPG compiler outputs can also be directed to the Fast Printer when it is attached to a model 6 or 10.

Special custom software is available for unique printer applications on all models of the System/3, the company added.

The printer handles multipart forms and has 132 print positions and 64 characters. Additional features include full line buffering and electronic forms control.

Options include special character sets, upper/lower case, boldface-accented characters and 48- or 96- character sets.

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Small Brewery Finds Small System Lifts Its Spirits

HENLEY, England – It may be surprising that a local, small, privately owned brewery like Brakspear's here should need to computerize its accounting systems.

Brakspear's, however, in common with other small breweries, has special problems which only computerization can solve. After considering various alternatives, the company opted for an installation which has not only solved its accounting and management information problems, but has also allowed it to offset a large percentage of the costs.

Altogether the brewery has about 350 customers and processes some 50 invoices averaging 40 items each per day out of a stock base of about 900 items. Before computerization, customers sent in their orders and the clerical staff then had to prepare the invoices and bills of lading so the six lorries operated by the brewery could be loaded and ready to start their deliveries early the following morning, complete with invoices.

The problem of returnable bottles and cases, which had to be sorted and calculated manually and debited or credited to the customer, was enormous and the brewery was slow in passing on these credits and debits.

Other Difficulties

There were other difficulties. The orders received by letter or telephone, for example, were written out by hand and often misread by unskilled labor in the cellars or spirit stores.

The brewery was also interested in obtaining certain management information.

Finally, the Burroughs Sensomatic accounting machines on which payroll, statements from invoices and bought ledger were processed were getting old.

In an attempt to solve these problems, Michael Chalcroft, Brakspear's managing director, looked at a variety of possible machines from such companies as Bradma, Addressograph, Burroughs and IBM. But the machines, varying from calculators and ledger card computers up to a full-scale computer, were either too slow to produce the output management wanted in the required time or too expensive. IBM, for instance, quoted a price in the neighborhood of $100,000 for a System/3 system.

It eventually fell to a local consultant, Dill Russell Ltd., to suggest a system based on a minicomputer. Dill Russell decided to use a Data General Nova 1220, as the center of the brewery's system.

Installed at the brewery early in June, it had 32K words of memory, two Diablo disks with 2.5M-byte cartridges, a Centronics line printer and two Olivetti TE 300 terminals.

T/S Bureau Standby

It is essential for all computer systems to have some sort of standby facility in case the machine should break down. Dill Russell's standby concept is to use a time-sharing firm instead of a machine similar to the one installed.

In case of breakdown, the operator only has to plug a terminal into the modem which links it to the telephone lines and dial the number of the bureau on the telephone. Within 20 or 30 minutes, he can continue operation exactly as if he were using the minicomputer machine in the room next door.

Six weeks were spent in building up a customer and stock data file and then, for a week, the system was run by the local time-sharing bureau which did all the invoicing.

The bureau has a magnetic tape which carries all the brewery's basic data necessary for an emergency and which can be loaded into the bureau's own computer if necessary.

Six weeks were spent in building up customer and stock data file and then, for a week, the system was run by the local time-sharing bureau, which did all the invoicing. The brewery was operating a parallel run at the same time.

Two Processings Daily

The new system started operation in mid-June. Now, when the brewery's customers send or telephone their orders, they are entered onto a precoded form which gives a day code, customer code and item code. The orders are then typed up directly on the Olivetti terminals.

The paper tape output from the terminals is read into the computer, which immedlately produces a six-part printout. The first part becomes the invoice; the second part the dispatch note; the third, fourth and fifth parts are the load notes which go to the beer, the wine and spirits and the soft drinks departments respectively: and the last part is an accounts copy.

The first lot of orders is processed between 10:30 and 12:30 every morning and loading is started so the orders will be ready for the first delivery the next day. The second batch of orders is processed during the afternoon, ready for the second delivery the next day.

At the same time that it is producing the invoice, dispatch and load notices, the computer is also updating the stock file by the amount depleted, setting up the open invoice file ready for statements and updating all the gallonage records against every pub, so that the brewery's management knows the breakdown between its own and others' beer, sold in gallons, by every pub.

All the bottles and crates which have to be billed to fill any order are automatically calculated and every invoice has a credit note, so there is a large credit system running as well. When the credits come back into stock, a credit note is issued and the bottles and cases are then invoiced out again.

The total cash business to date is also updated; this can then be tested against the credit limit of any customer. Batch transactions are posted to the temporary ledger and these are verified and sent through into the nominal ledger. From the postings to the nominal ledger, a complete sales ledger is created.

At present the computer run takes up approximately two hours of the working day. Eventually, when the whole system is fully operational with additional applications, it will occupy five hours a day.

The spare time is being sold to other users as a joint venture between Barkspear's and Dill Russell, which actually runs the computer for the brewery. Originally it was intended to offer an accounting service to local businesses, but two or three days after the Nova's installation several enquiries were received from other Data General users, and it looks as though the spare time may be fully utilized.

Here's an easy way to improve your printing output.



If the quality of your printed output does not reflect the quality of your organization, or, if your throughput is less than it could be because your printers are down too often, Grumman has a low cost, easy-to-apply answer: just hook up an IBM printer to your system with our printer controller.

Our printer controller interfaces an IBM 1403 model -2, -3, or -N1 to a variety of computers (Burroughs, CDC, Data General, DEC, Digital Scientific/IBM 1130, Univac, Xerox, and others on request). The IBM 1403 printer has compiled an unsurpassed record for print quality and reliability in thousands of installations. Now you can have the same benefits without having an IBM computer. And at less cost than the IBM user, because our Grumman printer controller costs less than IBM's.

Are you considering a change in your system, such as an upgrade, or a change in manufacturer? You may find that for the same or less money you can improve your print quality and throughput with the IBM 1403 and Grumman printer controller, instead of the printer your computer vendor supplies.

For multi-vendor installations we can add a switch to your controller to allow you to connect the IBM 1403 to either of two different computers.

You can rent, lease or buy both the printer and controller. For full information, call or write Joe McDonough, Grumman Data Systems Corporation, 45 Crossways Park Drive, Woodbury, New York 11797. (516) 575-3034.

Grumman Data Systems

Products and services that lower the cost of computing.

GRUMMAN

Publisher's System Reports Data On Products, Handles Accounting

SAN FRANCISCO, Calif. – Royalty accounting and product-line profitability are key features of the business computer system now in operation here at W.H. Freeman & Co., the textbook-publishing subsidiary of Scientific American, Inc.

"The system reports sales, cost of sales, royalties, promotional giveaways, and profit/loss by book – information never before available to us by product," according to Vice-President Adam Kudlacik. In addition to complex royalty accounting, including the printing of royalty checks, the system automates order entry and prebilling invoicing (6,000 invoices monthly, 70% of which are for Freeman's 4,000 regular customers), accounts receivable, sales analysis and inventory accounting.

Installation of the system software was handled by the Palo Alto, Calif., office of Informatics, Inc. Western Systems Co.

The system hardware was manufactured by Qantel and includes a Qantel System 1200, three video terminals (for input and inquiry), a 12M-byte disk drive (6 million of which are removable) and a 200 line/min hard-copy impact printer.

The system operates on-line, with orders, cash receipts, inventory receipts and other transactions keyed in on the video terminals. Analytical summaries, accounting reports and check writing are output through the Impact printer.

On-line inquiry into customer or inventory account status is available, and the visual display of information such as invoice amount, customer name and address and product description allows for data verification and correction at the point of entry.

Freeman publishes text and reference books, plus offprints of *Scientific American* articles as pamphlets in sets and bound collections. Its system replaces two billing machines, multifunction off-line processing by a service bureau and a variety of other business applications previously done by hand.

A TV Terminal in Every Home?

PHOENIX – A computer in every American home? For obvious reasons, that continues to be the dream of American computer manufacturers and the science fiction writers who trail in their wake.

But in a major planned community here, created by Rossmoor Corp., the dream begins to approach reality as installation continues on a two-way cable TV system that links each residence with an Interdata mini.

"In most cable TV installations, the traffic is one-way, as the black box on top of the TV set brings in more channels than would otherwise be accessible to the subscriber," explained Brian Belcher, director of engineering for Tocom, Inc. of Dallas, Texas, prime contractor for the two-way cable TV installation.

"However," he continued, "in our system, the terminal on top of the TV set not only brings in more channels of TV programming, it also sends out information to the minicomputer.

The minicomputer, for example, will sample each terminal every six seconds for fire, police and medical assistance alarm information. Each subscribing home has two heat-detecting sensors and alarm boxes for police and medical assistance alarms. These devices are wired into the terminal, which stores their information.

If it receives an affirmative message regarding fire, police or medical emergency, the minicomputer automatically prints out an alarm message for the on-duty security officer, nurse station and fire station, along with the address of the problem home and instructions for appropriate response.

Subscribers may also participate in opinion-polling experiments by pressing five response buttons.

Mini Installation By Taxpayers' Group Improves Efficiency

MELBOURNE, Australia – The Taxpayer's Association here, which finds speed essential when checking on government decisions, soon will follow its "economy with efficiency" advice to government by installing its own computer.

Formed in 1919, the Taxpayers' Association is a service organization for its members, providing government representation, information and education services.

With the Data General Nova 2/10, subscriptions paid by members in all the Australian states will be handled simultaneously. The computer will recognize which state association is entitled to the money and will allocate it automatically.

Subscription notices will be issued centrally, with the program taking into account any special features of the subscription structure of the state concerned.

The association decided to buy the mini because growth in membership in recent years had overloaded manual and mechanical methods.

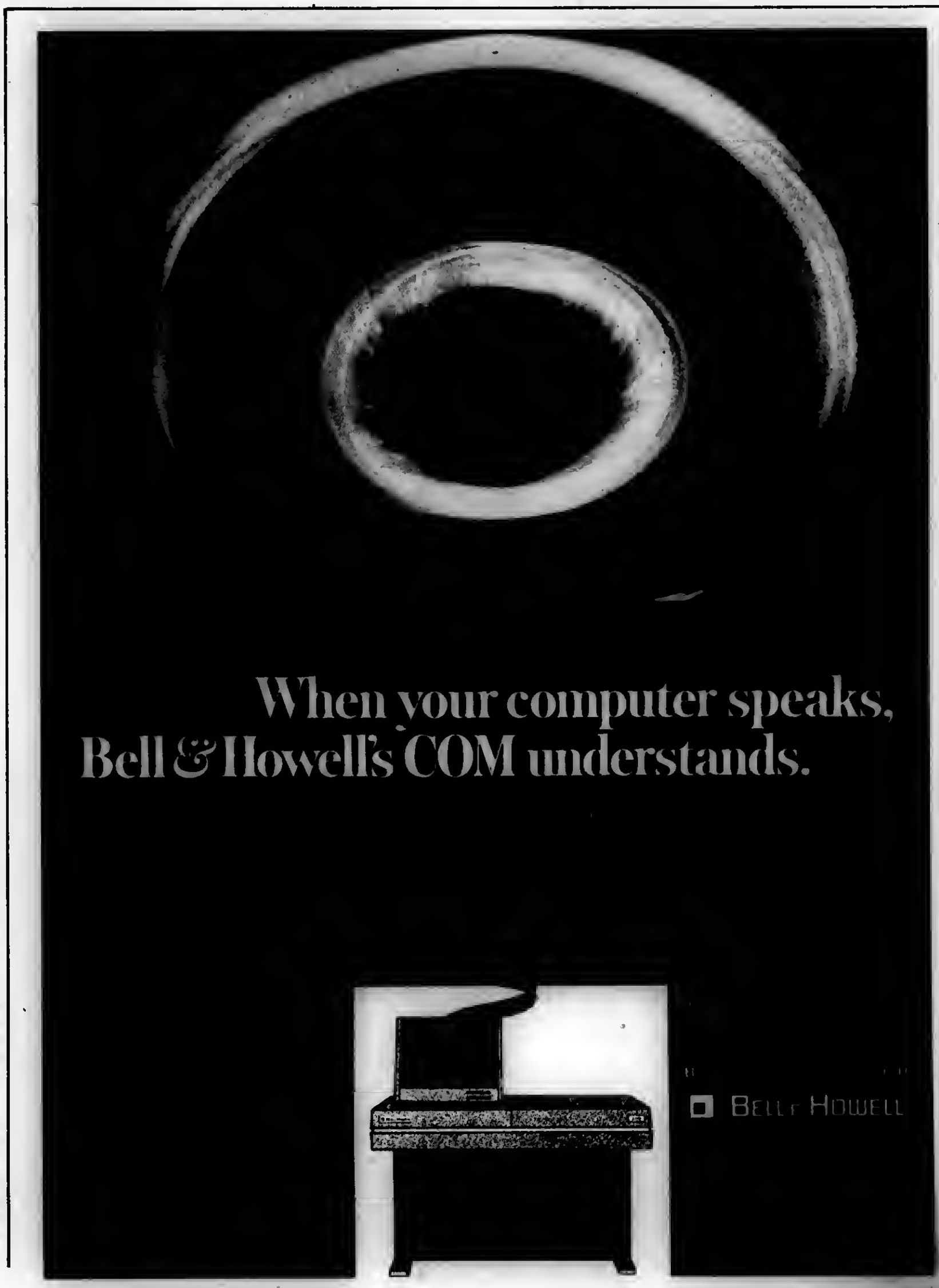
Every two weeks the association's journal goes to nearly 20,000 taxpayers, government departments and libraries in Australia and overseas. Producing journal wrappers in postcode order, expected to save money on postage, was virtually impossible with an addressing plate system.

The system, which will cost about $90,000, including the programming, will have 64K bytes of core memory, two visual display units and a teletypewriter. Membership records, the library of programs and other information will be stored on a 25M-byte disk which allows for the association's expansion.

Magnetic tape will be used to dump the information from disk every two or three nights. Each day, any vital changes to the records will be recorded on magnetic tape so everything can be restored in minutes if there is a machine or operator error.

Extended Time-Sharing Basic will be the programming language, and the equipment has the capacity to handle a large number of jobs simultaneously.

A 300 line/min printer will be linked to a Bowe forms cutter. The two units will operate virtually in unison to deliver wrappers and other papers as separate, cleanly trimmed sheets with no perforations.



15-Year-Old Buys PDP-8

Age No Barrier to Ownership of Mini

EASTHAMPTON, N.Y. – Why do most teenage boys save money? To buy a 10-speed bicycle, perhaps, or a first car or, if they are practical, for college.

Eric Hahn, a sophomore at Easthampton High School on Long Island, already owns a 10-speed bicycle and, at 15, is too young to drive. He hasn't been saving for college, either, although what he purchased with his money will certainly help him get there.

He bought a computer.

Hahn gained his first exposure to computing about a year ago, using a school terminal tied into the Long Island Regional Interactive Computer System (Lirics) Project, a time-sharing facility. Almost immediately computers became an all-consuming interest with him and, during frequent evenings until 11 p.m., he could be found at the school's computer center, becoming familiar with computing languages and learning programming techniques.

Return for Investment

He has already begun to give to the school and community a return in services for his educational investment. Last fall he helped develop some special software for the opthalmology laboratory at the local hospital, which owns a Digital Equipment Corp. PDP-8 minicomputer.

At school, he has been working on programs that will enable the time-sharing system to take raw data from weather stations' instruments and turn it into tables for the drawing of weather maps and forecasting by earth science students.

Independently, he has been developing a high-level language for the PDP-8 which, he said, "combines the features of the best languages I know and optimizes the features of the PDP-8."

As early as last summer Hahn resolved somehow to acquire his own computer, and he spent his vacation plus available evenings and weekends during the school year in a component assembly line at his father's electronics firm, stowing away each hour's wages toward the day when his dream would come true.

"I had seen advertisements for cheap, used computers," he recalled, "and decided to try one. But it was a disaster. That machine was really dead. At least the computer exchange took it back without any argument."

Help From Higher Quarters

Disappointed but undaunted, Hahn wrote to C. Gordon Bell, vice-president of engineering for DEC. Hahn recounted his activities, included a sample of the language he is developing – he calls it the Advanced Computer Emulating System (Aces-8) – and told Bell of his dream to have his own computer and terminal "so I can work on these projects without interruptions."

Hahn said he had saved enough to buy a small PDP-8 at the discounted quantity price for lots of 100 or more, but not enough to acquire one.

Bell responded first with a telephone call to Hahn to discuss his predicament and then contacted managers of DEC's Education Products Group for consideration. Earlier this year, the group, through Alice D. Peters, applications development manager, offered Hahn a PDP-8/M with Teletype terminal at terms within his reach – if he would deliver on his promise to pick it up at the company's headquarters in Maynard, Mass.

One thing Hahn's new possession is sure not to be is idle. "I'm working on an advanced time-sharing monitor for the PDP-8," he said. "Our school wants to give kids in the mathematics department access to a computer, and I'm working on a plan that may allow them to use mine."



Teenage computer owner Eric Hahn examines operation of computer terminal in the company of DEC's engineering vice-president, C. Gordon Bell. Hahn visited DEC recently to pick up a PDP-8/M computer and terminal for which he had worked and saved.

Large-Size Drives, Floppy Disk Systems Get Diva Reductions

EATONTOWN, N.J. – Diva, Inc. has reduced prices up to $1,300 on its line of large-capacity and floppy disk systems.

The DD-25, a 127.4M-byte capacity, dual-spindle drive which includes a DOS I/O driver on paper tape or 800 bit/in., 9-track drive magnetic tape, is now priced at $28,500.

The DD-23, a 63.7M-byte, single-spindle drive, has been reduced to $17,990; the DD14/2, a 63.7M-byte dual-spindle drive, is priced at $22,900; and the DD-14, a 31.8M-byte, single-spindle drive is now $12,600.

The DD-23, DD-14/2 and DD-14 all offer the DOS I/O driver on paper tape or 800 bit/in., 9-track magnetic tape at no additional charge.

Diva's DF-100 floppy disk controller, which includes a microprocessor and a controller/formatter with 16 bidirectional data bus lines, is now being offered at $2,095.

The floppy disk systems – DF-101, DF-102, DF-103 and DF-104 – have been reduced to $2,995, $3,750, $5,300 and $6,995 respectively.

These systems accommodate up to four drives and range in capacity from 3.1M bits to 12.4M bits. A DF-DMA interface is included with each system at no additional cost.

The firm is at 607 Industrial Way West, 07724.

Small System Provides Answer for Telephone Bureau

SANTA ANA, Calif. – How do you handle 5,000 accounts through 18 branch offices with monthly bills averaging $45 and about 4% client turnover each month?

George W. Smith, president of Telephone Answering Bureau (TAB) found the answer when he selected a small business computer for on-site data processing.

Since its establishment in 1956, Smith has seen TAB grow in both size and complexity. Serving Orange County and the nearby Los Angeles area, a TAB operator now performs over 40 different types of transactions, each with an appropriate unit cost.

Keeping track of many small items was cumbersome on bookkeeping machines, so TAB's first step toward DP was a terminal unit with printer.

Early in 1973, Smith teamed with Norm Hagelstrom, president of Business World Computer Systems here. Together they developed a package of programs designed for the accounting problems found in a telephone answer bureau.

The program package was written by Business World in RPG-II and operates on a Lockheed System III business computer with two disk drives, 24K bytes of memory and a medium-speed printer.

All input is through the CRT/keyboard console and specially designed forms which are prepared for each client once per month. Charges are consolidated daily at each branch office and TAB has four billing cycles per month.

In Complete Control

"What pleases me most is that now, for the first time, I have complete control and insight into the operation of my business," Smith said.

One of the benefits he cited was classification and analysis of accounts. "We know where our new accounts came from, and we know why they terminated service; we know their business classification or if they are residence accounts."

This brought improved response to TAB's computerized direct mail program and also reduced its cost. The system also includes usage reports by rate schedule, types of service and analysis of supplementary services.

Smith also gets a detailed 27-item monthly quantitive analysis report to evaluate performance of each branch office.

TAB has approximately 200 employees, of which only 11 are administrative. Smith said they have reduced their bookkeeping labor by 50% and now have closer control over labor costs.

Mini UPS Priced Under $2,000

GAINESVILLE, Fla. – An uninterruptible power source (UPS) from Synergetic Scientific Systems, priced under $2,000, is aimed at the small computer market.

Designed to give minicomputer users the same protection normally justifiable only on larger systems, the unit can supply 115 VAC or 230 VAC to a 1,000W load for either 15 or 30 minutes.

The output is both voltage and frequency regulated, according to the firm.

Synergetic Scientific Systems can be reached through P.O. Box 926, 32602.

Two PDP-11 Models Get Add-On Memory To Double Capacity

BEVERLY HILLS, Calif. – An add-on core memory system that can double the capacity of Digital Equipment Corp. PDP-11/15 and PDP-11/20 computers within their available chassis spaces is available from Litton Memory Products.

The Litton LM-820 is an 8K-word by 16-bit core memory system which is pin-compatible with both DEC models, the firm said.

Maximum storage capacity of 32K words can be achieved by using four of the available memory card slots within the computer chassis. This is accomplished through the use of a connector block designed to fit into the chassis spaces.

Because each connector block accepts two LM-820 memories, two blocks will accommodate the full internal memory capacity of these models without the requirement for extra equipment or power sources, the vendor noted.

The LM-820 core memories have a cycle time of 650 nsec, an access time of 280 nsec and 86-pin, edge-type connectors, the firm said.

Litton is at 360 N. Crescent Drive, 90201.

Mini Helps Design, Build Circuit Boards

GLEN COVE, N.Y. – Photocircuits Corp. bought a minicomputer to help design and build Multiwire circuit boards, but now everyone wants to get in on the act.

The company takes the circuit board specifications required by customers and develops the most efficient design using a Hewlett-Pakard HP Model 3000CX minicomputer system and special in-house programs.

After the results are drawn by a peripheral plotter and given final approval by the customers, the design data is recorded on paper tape. The tape is then fed into numeric-controlled wiring machines.

The Model 3000 replaces two older computers, according to Michael B. French, director of computer engineering.

"We were reaching the point where the pair of older computers just could not keep up with our demands, and the upgrading needed was too expensive," said French.

"We are now not only at full operation, but have even expanded our capabilities. With extra terminals and acoustic couplers, programmers can now work on new programs at their desks, instead of within the hectic computer room.

"In fact, as a result of our purchase of the mini, the entire company has become computer-minded. Taking advantage of the system's time-share capabilities, a number of other departments, like engineering design and inventory, are renting terminal time," French said.

For the past four years we've been developing our powerful GCS 2100 system and building its software support and service program. And we've never taken the time to tell enough people what a great system it is.

How efficient it is (average of 80% reduction in errors—35% to 85% faster document handling).

How reliable it is (less than 1% downtime).

How simple it is (operator training time less than 8 hours).

Or how economical it is (10%—40% savings in data preparation costs).

And our competitors have loved us for keeping it such a secret!

The GCS 2100 is a complete data entry system: it lets you collect and edit data at the source (data is actually edited while it is being keyed).

Store the data on disc. Then transfer the clean data to an output media like magnetic tape.

(Conversely, data already on tape or cards can be re-submitted to the GCS 2100 for aditing, reformatting, etc.)

By editing input data before it goes to disc storage, the GCS 2100 lets you quickly spot errors that could have become costly.

The GCS 2100 can interfaca up to thirty-two Touch-Tone® telephones. Card readers. Medium and high speed line printers. Four-tape drives. Four fixed or moving head discs.

All on a single system.

The GCS 2100 provides extensive I/O functions that allow you to transfer data to and from disc storage and other I/O devices, and provides an audit trail (comprehensiva statistical reports aid in monitoring the system and the operator's performance), all with minimum impact on a supervisor's time.

The GCS 2100 can accommodate up to 64 local or remote terminals: local terminals can be located up to 2500 ft. from the system's CPU. You get faster, more accurate data entry for functions like payroll, shipping, receiving and manufacturing, because the person most familiar with the data does tha kaying. (Note: we can supply a typewriter kayboard and a special CRT format so this person doesn't have to be a keypunch operator.)

In addition to data entry from local terminals, tha GCS 2100 offers data entry from remote terminals (it can handla up to five remote terminals over one dedicated telephone line); Touch-Tone® data entry; remote batch communications; and word processing.

A Programmable Extension Package (PEP) extends the power and the flexibility of the 2100 system: up to 255 PEP tables provide capabilities lika automatic data insertions; range and value checks; table look-ups; logical tests; character expansion (the operator keys S.D., South Dakota is generated on output); and automatic format switching.

And because thesa tables are not job assigned, they can be used on several different jobs. (Note: no programming experience is neaded to work with PEP.)

A library of over 100 special edits is also available. It handles things like field relocation; special balancing routines; manipulation of constants; and output editing requirements. (If there isn't an edit for your needs, we can design ona.)

The GCS 2100 also provides up to 99 format levals per job; up to 255 balance accumulators; variable length record and blocking factors; and up to 255 jobs stored in the system.

GCS DataTel: provides remote batch communications capabilities between the GCS 2100 systems and other 2780-compatible terminals and mainframas. And since the batch transmission of data is directly from disc to another mainframa, the usual step of transferring data to tapa can be eliminated.

GCS DataTone: is a low-cost, efficient and convenient method for collecting numeric data from remote sites. It is designed for updating inventory, shipping documents, orders, etc.

DataTone answers automatically and handles up to thirty-two incoming lines at once.

With DataTone, the GCS 2100 system can accept incoming telephone data without interrupting data entry from the terminals.

GCS DataText: is a multi-purpose shared-processor approach to word processing. Designed for high-volume typing requirements, it is a fast, efficient, low-cost method for producing customized letters, envalopes, forms, labels and reports.

And since DataText uses a disc library, manual handling of storage media lika cards, cartridges, etc. is eliminated.

If you'd lika to get in on more Graat Computer Sacrets, contact your local representativa or Tom O'Brien, Director of Domestic Salas at General Computer Systems, Inc., 16600 Dooley Road, Addison, Taxas 75001. Call (800) 527-2568/9 toll free or (214) 233-5800 within Taxas.

GCS 2100

General Computer/Systems Inc.

Streamlined System Speeds Bank's Trust Operations

ROCHESTER, N.Y. – In trust operations, Lincoln First Bank of Rochester designed its own automated system to insert a minicomputer interface between the original receipt of assets and its Computerized Trust Accounting System (CTAS).

The streamlined system made it possible to slash the time needed to open trust accounts by more than two-thirds.

Manual preparations were a slow process, said James A. Austin, assistant vice-president of trust operations. They often involved as many as five people and required the rearrangement of the same information as many as four times to satisfy the needs of the various functions through which it passed.

It was slow, and error-prone, since the information had to be recorded many times by hand, he said.

In all, it took about 10 days from the original receipt of the securities until the assets were recorded on the computerized trust accounting system, Austin noted.

Using an NCR 399 accounting computer, the bank established its own mini data processing unit in trust operations. At the same time, systems analysts took a hard look at the paperwork and procedures.

In most cases, the various forms required only a reformatting of the same information, so a standard five-part form was designed to replace them. If reformatting is necessary, it now is done with the minicomputer.

Data concerning customer identification, name and numbers of securities and transfer instructions now is entered on tape upon receipt of the assets. Once the assets are delivered to the minicomputer operator, he keys the basic data onto tape cassette and commands the machine to print out the standard five-part form.

Within minutes, one copy of the form goes back to the customer and another accompanies the securities to the vault. The securities are placed in the vault the day they are received.

For any subsequent functions, the data now is on tape and can be recalled and changed as needed.

Another copy of the form is sent to the pricing unit, which establishes the inventory value of the assets. Once the prices are returned to the minicomputer, the operator recalls the basic information from the tape and inserts the values through the keyboard.

The memory is programmed to then type out the transfer form and automatically punch the input cards for the main computer that will update the CTAS.

Recopying of the information has been eliminated, including input data for the main computer, because the information is machine-available. This eliminates many possible errors, Austin said.

Sets Up Assets Values

Under the manual system, before the securities could be entered into the main computer, the inventory value of the assets had to be established. It was more efficient to wait for the values and keypunch the cards only once.

However, because the keypunching now is an automatic by-product of the minicomputer's operation, this policy was changed. If the values are not available within three days of the receipt of these securities, cards now are punched to set up the assets at nominal values for the CTAS, and the basic account information is retained on tape.

When the values do come through, new cards are punched which modify the data in the main computer. This makes it possible to set up assets within three days instead of the 10 days it formerly required.

The program, major security names and numbers and transfer agents' names and addresses are read into the computer's memory from tape cassettes.

To print out the name and address of a prime security or a transfer agent the operator keys in a single code number at the appropriate point in the program and the 399 automatically prints it out in the right place on the form.

The minicomputer is equipped with two tape handlers. After the program and constants are read into the memory, a master tape cassette containing data on all accounts in process is mounted. A blank tape is mounted on the second handler. When data is added or modifications are required, the operator calls up the account by code number.

The minicomputer then writes all previous data on the master tape to the blank tape. The operator keys in the modifying data, which is then recorded on the new tape. Thus, nothing is lost and the new data is recorded in sequence.

After completion of the new entries, which may number up to 150 a day, the rest of the data on the master is written on the new tape automatically, and a new master is created containing the latest transactions.

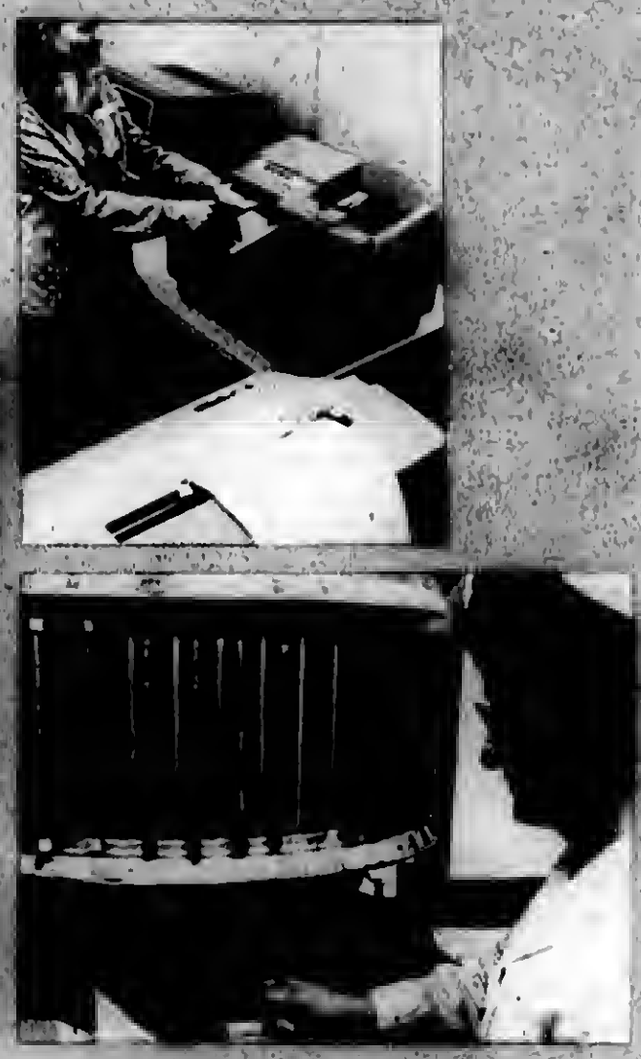
If the entries are to be released to the CTAS, the system instructs the operator to insert the transfer form, types it out automatically and, with its keypunch peripheral, punches the cards.

While the minicomputer speeded up the entry of securities and reduced the number of "people hours" required, it had time available for other applications. The bank piloted it on estate accruals to provide more meaningful reporting to the Personal Trust Department, Austin said.

For The Twin Cities — A Hospital Data System That Delivers:

INCOTERM®





The Hospital Services Division of McDonnell Douglas Automation Company serves the data processing needs of America's health care industry. In fact, McAUTO works for more hospitals than any other company of its kind.

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In McAUTO's Hospital Financial Control System, for example, INCOTERM provides fast access to patient accounting files under exacting control routines and helps to automate all of the hospital's accounting functions. File maintenance. Census changes. Patient billing and collection. Filing and cancelling of insurance claims. Health care price data. Payroll. Accounts payable. Property accounting.

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INCOTERM: More Power To Your Terminal.

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Sales and customer service offices in major cities throughout the United States and abroad.

Facit Addo Tape Reader, Spooler Added to 4020

GREENWICH, Conn. – Facit-Addo, Inc. added the 4023 optical tape reader and the 4014 servo tape spooler in a rack mount unit for full tape-handling capability as an addition to its 4020 line of optical tape readers.

The 4023 and 4014 may also be incorporated individually into any system, but are especially designed for use in combination.

The Facit 4023 is equipped with electronics which permit the reading direction to be reversed at the desired character. It also features a lifter solenoid for the pinch roller, which permits reading during high-speed spooling in either direction.

Among the features of the Facit 4014 servo tape spooler are a push button for manual high-speed spooling at an average speed of 1,200 char./sec.

The unit is priced at $2,290 from the firm at 66 Field Point Road, 06830.

Computers At Work In Education...

So what if, by 1984, computers will be used in 50% of the nation's elementary and secondary school classrooms? Do they work? What are some instances of advantages and disadvantages stemming from the use of computers in education?

On this and following pages, *Computerworld* looks at a few of the successes and discusses some of the failures recorded in the annals of computer-assisted instruction (CAI) and related automated efforts in the educational field.

In addition, this month's mini-report includes stories on authorship and a system that swears only when sworn at.

Have Schools Found Them Worthwhile?

Mini Plus Math Multiplies Pupils' Interest in Division

• Yes...

By Edith Holmes
Of the CW Staff

CHICAGO – Two Chicago-area elementary schools have discovered minicomputers prove excellent drillmasters when it comes to teaching young children basic arithmetic facts.

The computer-assisted instruction system takes the tedium out of learning multiplication tables and the like by providing kids with immediate results in hard-copy form, including the average time spent per problem, according to Walt Weller of Automation Software Associates here, author of the system's design and software.

"As generations of school children and teachers who must grade them can testify, the business of repeated drilling until the child responds automatically has always been boring and oppressive," Weller said.

Seated at a Teletype, however, "children learn faster because the techniques employed make the whole process interesting to them," he added.

Dubbed Henry VIII and controlled by an LSI 11 Naked Mini from Computer Automation, Inc., the system provided an unexpected benefit by being particularly attractive to children with learning disabilities, he said.

These students, who are not mentally retarded but have learning handicaps such as dyslexia, can work at their own pace, facing one problem at a time. They have sharpened their arithmetic skills as a result, Lola J. May, mathematics consultant for the northern Chicago suburb of Winnetka, said.

Weller's system supports a single terminal in Winnetka and three terminals at the Daniel Boone School in Chicago. Last year, he noted, the 120 children using the system at Daniel Boone worked over 200,000 problems.

"Kids typically do 150 problems in 15 minutes and, by the end of the year, were fighting over the terminals to do them," he said.

The system allows the student to interact with a terminal which types out arithmetic problems, generated by the mini at random and at the level appropriate to the child's knowledge, he explained. The student responds by typing the answer; if it is correct, a new problem is typed or can be displayed on a CRT, again at random.

If the answer isn't correct, the problem is retyped with the appropriate answer. The child has five seconds to study the problem before a new one is typed.

The error is stored in the mini's 8K core memory and, within the next eight problems or so, reappears to test whether the student remembered the correct answer. Weller explained the system can store six such errors, feeding them back to the child at random intervals in between the programmed problems of the drill.

At the drill's end, the child receives a printout of the exercise, the problems missed, a percentage grade for performance and the average amount of time each problem required.

May noted the children love to walk away with that piece of paper showing what and how they have done on the drill. Teachers appreciate the self-grading feature because of the time it saves them from a boring and routine task, and they can use such tacts as mean time per problem to help slow students who may be solving problems by counting on their fingers, she said.

The tcacher can also control the level of difficulty of each drill, Weller said. Twenty-nine levels of drill are available, including six addition, five subtraction, three multiplication, four division, four enumeration and inequality and seven

(Continued on Page 56)

District Questions Validity of Activity Printouts

• Maybe...

By Edith Holmes
Of the CW Staff

MUNCIE, Ind. – Parents and teachers of 300 children beginning kindergarten at four elementary schools here this month will soon receive printouts of priorities and activities customized to fit each student's learning needs.

Based on a screening program designed to spot potential learning and behavior problems as soon as possible, the computer program takes the results generated by a series of perceptual and motor tests and prints out the items parents and teachers first need to concentrate on with the child.

The list includes those specific activities most likely to improve the student's performance, according to Fred R. Glancy Jr., director of thc program, called "Insight Unlimited."

But while this use of automation to help educate may be sound, controversy over the real conncction between motor and perceptual skills and, for instance, reading ability, could also cast doubt on the validity of computer use in this instance.

Those in favor of screening contend it holds great promise for those whose perceptual and motor problems make it difficult for them to learn in school, which in turn limits what they can do when thcy leave educational institutions. And those opposed to the plan fear many children who arc simply troublesome or difficult are being labeled with learning handicaps that might be self-fulfilling in the long run.

But those responsible for computerizing test results to provide teachers and parents with a plan of action for each child screened are chiefly concerned that the output generated will be intelligible and of some use. "After all, we're doing this for the kids," Dick Robinson, president of Resource Systems, Inc., the firm creating the software for the information system, commented.

Compiling Data Base

Muncie's Delaware Community School Corp., which runs "Insights Unlimited," has screened nearly all 4,000 elementary, middle and high school students in the surrounding school districts. The results of the series of tests each child goes through form the basic input data, according to Robinson.

The data base from which learning priorities and activities are drawn comes from a compilation of all available information on what training activities will tend to improve what performance in the classroom. This information was put together by the staff of "Insights Unlimited" and handed over to Robinson and Resource Systems, according to Glancy.

The eventual result of these inputs will be an on-line retrieval system any school district in the country can employ, given the necessary hardware, Glancy said.

Robinson noted that, at this point, some 46,000 pieces of test and data base information have been keypunched into the system and are coded on tape. Working in Cobol up to this point, "we blitzed the program first to get as much as we could into data entry. Now that we've entered it, we're retrieving it to see what the information looks like," he said.

"Once we've decided how to modify output format and language to make that information comprehensible to parents and teachers, we'll correct, test and debug all our programs," Robinson added.

Currently in the process of making output information understandable for those applying the remedial programs, Resource Systems also plans to move the system from an Indianapolis computer center to the Purdue University computer system.

Robinson noted that, once output needs have been clarified, he and his staff will determine what combination of hardware, software, storage and retrieval will best accomplish the job.

The two kinds of priorities and activities lists that will be generated by computer – one for teachers and one for parents – won't identify the problem the test results revealed, Robinson said. They'll simply provide some potential solutions. In this way, each child has a customized program based on limitations as well as abilities, without an undue emphasis placed on problem areas.

All the computer does here is automate the recordkeeping process on each child and make available to parents and teachers the full range of information on what can be done to help improve skills.

Noting that teachers are often scared by automation in their classrooms, Robinson said some of his chief concerns in designing the output will be to make it "efficient, easy and dramatic. We want teachers to be comfortable with this information so they will adopt the program on a regular and consistent basis," he added.

Funded by federal monies under Title III of the Elementary and Secondary School Act, "Insights Unlimited" received $180,000 last year and another $50,000 this year, according to Glancy. It has a total of three years in which to prove itself.

Lack of Funds, Terminals Cause System to Flunk Out of Classes

• No...

By Toni Wiseman
Of the CW Staff

REDDING, Calif. – The computer has been heralded by some as the greatest boon to education since colored chalk.

Others, however, think the computer has flunked the test.

While the philosophy of computers in education was implicated, the lack of sufficient funds and equipment were the main reasons for the discontent voiced by teachers in the Enterprise Elementary School District here.

According to a report published in a local newspaper, 19 teachers said the computer was an asset to their teaching while 61 said it was not.

The reasons for the dissatisfaction were several, according to superintendent Gilbert Goetz.

"There were some teachers who were dissatisfied because they felt we were drawing funds which might have been used for other educational purposes," he explained. "Others objected to the mechanical, dehumanized nature of the computer."

In a related complaint, somc instructors thought the use of a computer "smacked" of programmed learning, a technique of which many tcachers disapprove, Goetz said.

"I have a reservoir feeling that the philosophy of computers in education hasn't been accepted because of the mechanical nature of the device," he added.

But the main reason the computer flunked was financial, he noted, citing a lack of funds to run the computer to its full capability.

"The system was not meeting the requirements we felt it should," Goetz said, "and this was due to the fact we could not provide the information or the equipment the tcachers needed to realize its potential."

The system had been financed by a federal grant to test its effectiveness as a test-scoring and recordkeeping tool designed to leave teachers more time to work with the students.

When the funding ran out last year,

(Continued on Page 56)

T/S Math Program a Matter of Self-Defense for Dad

CHICAGO – What would you do if, every afternoon at 3:30, a bunch of kids congregated in your office to use a minicomputer to practice their arithmetic problems?

Walt Weller decided the time had come to write a time-sharing version of the system he had constructed for his own children to help them improve their basic math skills.

Computers At Work In Education

Now the children gather around Teletypes located at two Chicago-area schools at 3:30 or whenever they think they'll be able to work a drill in addition, multiplication, subtraction or division on the machines.

Running Automation Software Associates from an office located in his home, Weller said his specialty is exotic computer applications, particularly those for industry and medicine. The program for his children and the schools represented the first thing he's ever done in education, he added.

He hedn't particularly planned to get into the field; it just happened. "One day my eldest son came home from school, and I asked him something about his multiplication tables," Weller recalled.

Then nine years old, "my son responded, 'Oh, Dad, we don't do that any more.'

"I went right through the ceiling."

With a little research, Weller discovered that, during the preceeding 10 years, arithmetic achievement in American schools had dropped one full year. Attributing much of this to "new math," a program strong on concepts and problem solving but weak on memorization and rote learning, he set about devising a wey to help his children improve their basic math skills.

"We acquired an old Alpha 16 and e purloined office desk," he said. "I removed the drawers from one side of the desk, replaced them with a rack and set the minicomputer in the reck on its side."

With the aid of a teletypewriter hooked to the mini, the children practiced their drills – and enjoyed the exercises. Before long, Weller's son's teacher was introduced to the device, and she began sending kids over to the office after school for extra help.

"Living just one block from the school, my lab was soon filled with kids every afternoon," he said. "That was fine, but it meant I couldn't get any work done. And that tended to put a strain on my livelihood."

So he sat down again and converted his programs into a time-shering system that would be economically feasible. "We found a private angel to fund the hardware – an LSI II Naked Mini from Computer Automation, Inc. end three 10 char./sec Teletypes," he said. Weller himself has never made a nickel on the project.

The system is entering its second year of operation at the Daniel Boone School in Chicago. Weller has continued to make improvements to the programs and hopes to add exercises on the metric system.

With some kind of upper- and lowercase teletypewriter and e mass storage device, Weller noted, he could write programs for foreign language drills as well.

Also in use et e school in Winnetka, a northern suburb of Chicago, Weller's system is such a hit with the kids "they act as if somebody died whenever there's a breakdown," according to Lola J. May, mathematics consultant for the town.

Commenting on his efforts, Weller remarked, "Children are human beings end they deserve to be taught by human teachers. I'm not an exponent of eutomation in education, except where the information is the kind that can only be learned by rote."

Mini Perks Interest In Arithmetic Facts

(Continued from Page 55)

fraction exercises.

Student results are recorded internally in the system for later examination by the teacher. The teacher can request a report which identifies the child, the text exercise, the number of problems in the test, the percent correct, the time spent per problem and the date on which testing was done, he commented.

Records can be kept for 250 children this way, relieving the teacher of a considerable amount of recordkeeping.

A true time-shared system, the mini cen support as many as 12 terminals with no mass storage of any kind and can be adapted to eny other available terminal, Weller noted.

Late this fall, the participating schools will have collected enough data on the children's performance to determine just how much the system has helped them sharpen these skills, he added.

System Flunks Out

(Continued from Page 55)

however, the district had to ante up $34,000 a year to finance the operation.

A survey of teachers and parents, as well as an in-depth analysis, were conducted to evaluate the system. This evaluation led to the termination of the project, Goetz said. "We couldn't justify the funds.

"I regret that we're no longer able to provide this resource," he said, "but it was instituted as an innovative program end such programs ere often not all they should be. It could have been much more effective."

Goetz revealed, for example, that not all schools in the district had terminals.

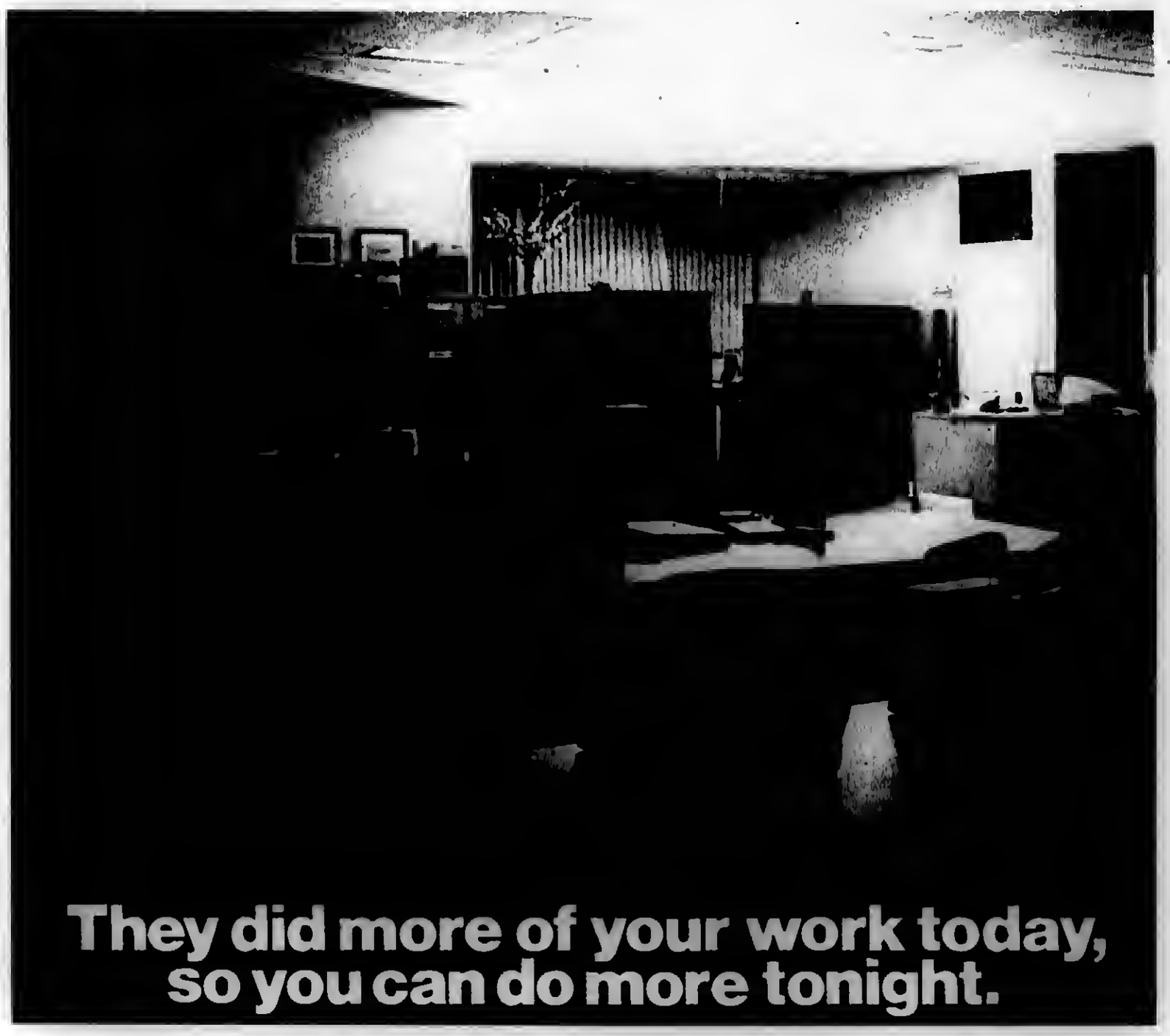
Those with terminals could have their students run their own tests in programmed subjects such as math, reeding and science and receive instant feedback, while teachers in schools without terminals used the computer to score batches of tests and get mass results.

All testing and recordkeeping will now revert back to the manual system, Goetz said.

Goetz is still e proponent of computers in educetion. He noted that, while this project failed, the single experience does not mean such efforts will never succeed.

"But," he added, "if such a project is ever offered to us again, I will approach the whole thing differently. There will have to be terminals readily available for every school, end a clearcut plan for implementation.

"Most of all, there will have to be a clear-cut plan for funding."



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*Documentation available on request



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CPU Programmed to Go to Hell, But Not Dedicated to Obscenity

By a CW Staff Writer

AKRON, Ohio – A morally upstanding computer system at the University of Akron understands and responds to assaults of students' curse-laden verbiage without getting too heated up.

For example, if a student types, "Go to Hell!" on the IBM 3270 CRT terminal, the system retorts, "OK, you asked for it!"

Computers At Work In Education

A note then appears on the screen, which reads, "The computer has gone to Hell." The system signs off, forcing the astounded student to sign on again, according to Tim Taylor, assistant director of the computer-assisted instruction (CAI) center here.

Taylor emphasized the above discourse is one of the less volatile. The university's multipurpose IBM 370/158, however, isn't dedicated just to obscenity.

Programs for both the introductory course to the school's CAI program and the statistics course are the only ones where the IBM Coursewriter language allows obscene quips, Taylor said.

The use of swear words is for fun, he noted. It makes learning the ins and outs of computer use even more adventurous and brings levity to the statistics course.

When asked if CPU time was wasted as a result, Taylor said the novelty wears off after a short time, and students who play with the system often can be spotted by the center's staff because there's too much laughter.

"If students are in stitches all the time, then you know they're messing around," he said.

The CAI center supports about 40 courses, including a majority of math courses and courses in English, psychology, natural science and guidance, among others, Taylor said.

There are a total of 12 Model 3270 CRTs (two have light pens) and two Anderson-Jacobson (AJ) portable teletypewriter terminals which can be used at off-campus locations through a standard telephone interface, he noted.

The AJ terminals, he said, can be used to access the verbally spirited system from another university during a demonstration.

And Taylor said he's done exactly that, just for the Hell of it.

'Aset' Lets Teachers Write Own Lessons

BLUE BELL, Pa. – Teaching may be easier for instructors at all levels of education this fall with a software program for individualized computer-assisted instruction (CAI) from Univac.

Instead of depending on the traditional prepackaged CAI curricula, teachers can organize and develop their own lessons and drills or modify those created by others.

And the Author System for Education and Training (Aset) allows instructors in education, industry, government and other fields to develop automated training programs to meet their specific needs without formal knowledge of computer programming.

Using Author language, an English-type language developed by Univac, the instructor enters two basic components into a terminal – tutorial text and a command section.

The author may elect, for example, to write four or five frames of tutorial text and then a review frame. Or he may follow the tutorial text with drill questions.

He also has the option of programming the lesson so that an incorrect answer triggers a return to the pertinent section of tutorial text. The Author can also code for two trials, then supply the student with the correct answer and ask the question again later in the program.

The program also collects data for the instructor to use in evaluating a student's individual progress or that of a class as a whole.

An additional Aset release, scheduled for January, will add graphics capabilities to the instruction, according to a Univac spokesman.

The program requires 9K of core plus 1K for each additional terminal, according to Univac.

Aset is available to all Univac 1100 Series users under the 1100 operating system. It will be licensed for $375/mo.

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A special supplement on Source Data Entry - in the October 29th issue of Computerworld.

What used to be the exclusive domain of the keypunch operation has become the object of a confusing mass of systems, varying from card punch to OCR to distributed data entry and new, hybrid systems. This special supplement, edited by Vic Farmer, will analyze the many data entry applications in use today. Special emphasis will be given to capturing data at the source. It's projected to be the biggest CW supplement of the year, and it will be filled with applications stories, tutorials and viewpoints from users and experts on data entry. You'll see articles on subjects like these:

- Key-to-disk and key-to-tape
- The effective use of turn-around documents
- On-line data entry
- Terminal systems
- Distributed data entry
- Customized turnkey systems
- Optical Character Recognition systems
- New "Hybrid" systems - combinations like OCR and keypunch

If you're involved in the data entry process at your organization you should key in to this special supplement in the October 29th issue of *Computerworld*. And if you're a marketer of data entry products or services, your ad should be there. Don't miss the October 10th ad closing date. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Benefits and Bane of CAI Felt in High School, College

By John Hebert
Of the CW Staff

Computers and terminals in a Maryland school system and a Texas university represent the growing use of automation to teach students of all ages.

Computers At Work In Education

Among the longer-lived examples of computer-assisted instruction (CAI), the efforts of Montgomery County Public Schools (MCPS) in Maryland and the University of Texas at Austin illustrate both the benefits and the bane of CAI programs: individualized instruction for students and a more efficient use of teachers' talents on the one hand and a struggle for funding support on the other.

At MCPS, computer systems have been used to supplement conventional instruction since 1968, according to Catherine Morgan, director of the CAI program headquartered in Kensington, Md.

In that year, four IBM instructional assistants working on an R&D program funded by federal Title III funds implemented a CAI program using an IBM 1500 system, Morgan said.

In June 1971, federal funding was terminated, but local funding allowed the continuation of MCPS' CAI program.

Today, the school system has an IBM 370/158 dedicated to time-sharing for 91 student and administrative terminals in classrooms and learning laboratories in 20 elementary and secondary schools. The computer capability is used to supplement and manage math computer literacy social studies and remedial and language arts courses, among others, in a variety of grade levels, Morgan said.

Morgan believes the use of the computer system is changing the educational process at MCPS. The primary goal in all 20 schools, she explained, is the individual, and this is where computer capability is most important.

"I used to be a math teacher. I couldn't go back to teaching the way it was before," Morgan said. "There's no way you can do the things that are really necessary when you are alone with a class of 30 or 40 students."

In addition, the computer system allows the teacher greater insight into problem areas because it acts as a continual monitor, demonstrating where each child "is" in terms of progress.

In Morgan's view, what the educational computing community as a whole "really needs is about two to three years more funding support. Manufacturers will see a market is there" if CAI in public schools is to keep up at the present rate, she said.

At the University of Texas at Austin, a Control Data Corp. 6400/6600 Taurus system dedicated to time-sharing for administrative functions has also been serving instructional needs since 1971 for the university's computer-based education program (Project C-BE).

Local computation for the project, funded by the National Science Foundation (NSF), and serving 29 courses ranging from zoology to aerospace engineering, is accomplished by a Data General Nova 840 CPU with 48K memory on dual disks and two Nova 820 acquisition systems, a spokeswoman said.

The four-year endeavor was aimed at exploring the effects of computer-based instruction at a large university. Project C-BE has received over $1.6 million in NSF grants since its inception, she added.

But NSF support was terminated last month, and the university must cultivate new funding sources.

This may prove a difficult task because of the large scale of the project. Courses in the humanities may suffer a reduction or a loss of computer capability because subject matter is less concrete and, therefore, harder to apply than in the pure sciences, according to Susan Wittig, assistant professor of English at the university.

Wittig considers the use of computer capability a real boost to teaching the university's freshman English course, "typically the problem course in the English curriculum." she said.

Using Datapoint 3300 CRTs to present instruction modules, sentence syntax can be taught in an interesting and productive way, Wittig said. Seven computer-tutorial programs in English syntax have been used to supplement the course work of 150 students.

Students in the course are expected to develop retention skills – not having hard copy as reference – and put learned concepts into subsequent writing assignments, Wittig noted.

The use of the automated system has had the "effect of concretizing subject matter in the humanities where everything is not cut and dried."

"Once the student sits down at the CRT terminal, both student and instructor perceive difficulties in teaching methods that were never imagined before," Wittig said.

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To Bridge Gap With Congress

Afips Opens Washington Office

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – The American Federation of Information Processing Societies (Afips) has opened an office here to communicate in two directions, "from Washington to our societies and from the societies to Washington – to the legislature, to the agencies and to others who have an interest in technology and where it might be going," according to George Glaser, past president of Afips.

Speaking at the office's official opening earlier this summer, he added that although "we are explicitly excluded from lobbying activities as well as involvement in policy questions (because of Afips' tax status), we would like to believe we can be helpful in assisting people to sort out the technological implications of proposed policies.

Four speakers representing the Federal Government, industry and the academic community helped inaugurate the office as well – Sen. John C. Culver (D-Iowa); Dr. Brockway McMillan, vice-president of military systems, Bell Laboratories; Dr. Ruth Davis, director of the Institute for Computer Sciences and Technology, National Bureau of Standards, U.S. Department of Commerce; and Dr. Allen Newell of Carnegie-Mellon University.

Their remarks centered around the theme "Information Processing as a National Resource."

Culver remarked that Congress remains a "computer backwater" in the effective utilization of DP technology, despite the rising level of consciousness among increasing numbers of its membership.

"Too many legislators are under the deep-seated impression that there can be no useful marriage of computers and the legislative process," he said.

DP professionals must, however, consider the needs of Congress with a sense of realism," he added. "Computers cannot relieve the congressman of the pains of decisions, of a congested calendar or of the multitude of demands placed on him.

"But computers can provide him with some navigational aids which we don't have right now. And they can help achieve a more rational use of the resources we do have," he said.

Optimizing resources was also stressed by McMillan, who said the central question is not "what kind of gadgets we are going to have, but rather how effectively we use them."

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"We have a highly interactive technology that affects every one of us in our daily lives," she said, "and we do not know how to deal with it. The people who are making the policies generally are not the scientists and technologists, and yet the changes we see today are generally caused by science and technology."

Davis said she hopes the Afips Washington office will be able to bridge this gap and help foster a greater understanding of computer science and technology. In his remarks, Newell implied that, as a national resource and a discipline, computer science itself might add to this understanding. He stressed the role of the university in developing this resource.

The Afips office will be directed by Philip Nyborg, and Glaser extended an open invitation to all to call upon Nyborg.

The office is located at 2100 L Street N.W., Suite 420, 20037.



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User Groups

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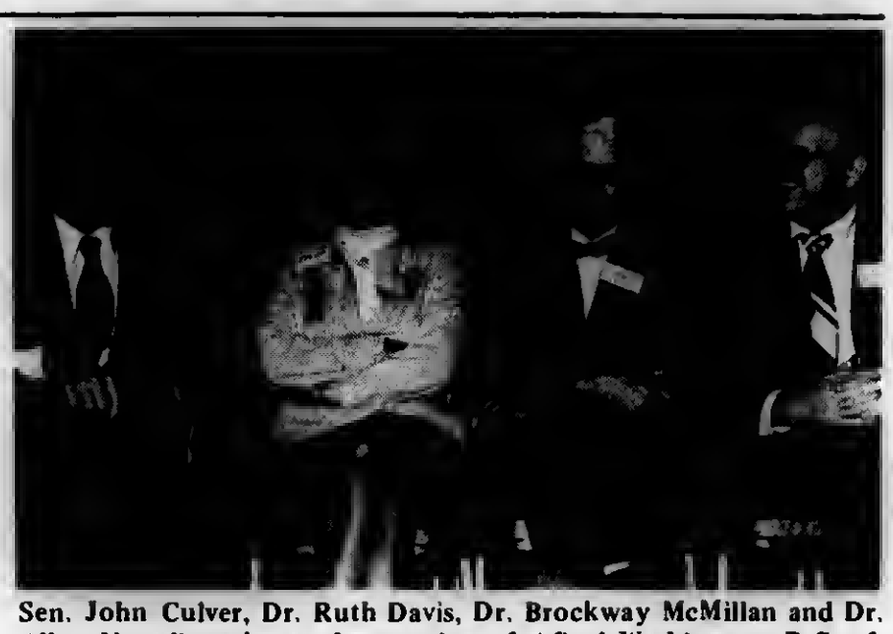
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Law Group Looks at Taxes

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Calendar

Sept. 11-12, Boston – **1975 Eastern Regional Operations and Automation Workshop**, sponsored by the American Bankers Association. Contact: ABA, 1120 Connecticut Ave., N.W., Washington, D.C. 20036.

Sept. 14-19, Las Vegas – **International Conference on Environmental Sensing and Assessment**, sponsored by the Insitute of Electrical and Electronics Engineers, Inc. Contact: IEEE-TAB, 345 E. 47 St., New York, N.Y. 10017.

Sept. 17-19, Washington, D.C. – **1975 Mumps Users Group Meeting**. Contact: Dr. Joan Zimmerman, Mumps Users Group, Biomedical Computer Laboratory, 700 South Euclid Ave., St. Louis, Mo. 63110.

Sept. 21-25, Washington, D.C. – **International Symposium on Computer Assisted Cartography**. Contact: Dorothy Bomberger, Symposium Secretariat, U.S. Bureau of the Census, Washington, D.C. 20233.

Sept. 22-24, Chicago – **Fifth International Symposium and Exposition on Industrial Robots**. Contact: Edward P. Fahy, IIT Research Institute, 10 West 35th St., Chicago, 60616.

Sept. 23-25, London – **Eurocomp**, the European Computing Congress. Contact: Christine Amon, Online Conferences Ltd., Brunel University, Uxbridge Middlesex, England.

Sept. 29-Oct. 1, Toronto – **International Electrical, Electronics Conference and Exposition**. Contact: 1450 Don Mills Road, Don Mills, Ontario, M3B 2X7, Canada.

Oct. 1-3, Itasca, Ill. – **5th Annual Association of Computer Programmers and Analysts (Acpa) National Conference**. Contact: Acpa-V Conference Headquarters, P.O. Box 2349, Chicago, 60690.

Oct. 1-3, London – **Datafair '75**, the British Computer Society's sixth biennial computer conference. Contact: Terence Carville, Infoplan Ltd., 20 Eastbourne Terrace, London W2 6LN.

Oct. 4-8, New York – **Centennial Convention of the American Bankers Association**. Contact: Convention/Meeting Services Division, American Bankers Association, 1120 Connecticut Ave., N.W., Washington, D.C. 20036.

Oct. 7, Los Angeles – **1975 Western Systems Conference**, sponsored by the Association for Systems Management, Contact: John P. Lane, Lloyd's Bank California, 548 S. Spring St., Los Angeles, 90013.

Oct. 7-8, Washington, D.C. – **9th Annual Instrumentation and Computer Fair**. Contact: Robert Harar, Instrumentation Fair, Inc., 5012 Herzel Place, Beltsville, Md. 20705.

Oct. 12-15, Toronto – **20th Annual Conference of the Association of Records Managers and Administrators (Arma)**. Contact: Gerald L. Hegel, Tab Products Co., 617 Vine St., Suite 1309, Cincinnati, 45202.

Oct. 13-16, Boston – **Univac Users Association Fall Conference**. Contact: B.J. Frable, Sperry Univac Division, Sperry Rand Corp., P.O. Box 500, Blue Bell, Pa. 19422.

Oct. 13-17, Atlanta – **37th Annual Meeting of the American Society for Information Sciences (Asis)**. Contact: Dr. V. Slamecka,

Societies/ User Groups

School of Information and Computer Science, Georgia Institute of Technology, Atlanta, 30332.

Oct. 14-16, Lausanne, Switzerland – **1975 International Conference on Advanced Signal Processing Technology**. Contact: Secretariat of "Journees d'Electronique," Ch. de Bellerive 16, 1007 Lausanne, Switzerland.

Oct. 14-16, Brussels – **Second International Symposium on Camac in Computer Applications**. Contact: Organizing Committee 2nd Camac Symposium, De. H. Meyer, c/o Commission of the European Communities, C.R.C.-CBNM, Steeweg naar Retie, B-2440 Geel (Belgium).

Oct. 15-17, Chicago – **13th Annual Government-Industry Data Exchange Program Workshop**. Contact: John W. Reed, Raytheon Co., Dept. 7362, 350 Lowell St., Andover, Mass. 01810.

Oct. 19-24, Kansas City, Mo. – **Computer Systems in Law Enforcement Workshop**. Contact: Betty B. Bosarge, Professional Standards Division, International Association of Chiefs of Police, Eleven Firstfield Road, Gaithersburg, Md.

Oct. 20-22, Minneapolis – **ACM '75**, the annual conference of the Association for Computing Machinery. Contact: ACM '75, P.O. Box 658, Hopkins, Minn. 55343.

Oct. 22-24, Cleveland – **Computer Management Association and Honeywell Users Group Joint Users Conference**. Contact: John Smalling, Oglebay Norton Co., The Hanna Building, 1422 Euclid Ave., Cleveland, 44115.

Oct. 26-29, Atlanta – **Bank Administration Institute's 51st National Convention**. Contact: BAI, P.O. Box 55, 303 S. Northwest Highway, Park Ridge, Ill. 60068.

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COMPUTER INDUSTRY

CI Notes

GAO OKs Line of Business

WASHINGTON, D.C. – The General Accounting Office (GAO) has given the Federal Trade Commission (FTC) approval to send out the 1974 forms for line-of-business accounting to over 400 large manufacturing firms.

The matter was held up pending GAO's satisfaction that the FTC had taken steps to simplify the questionnaire, reduce the cost of complying with the program and to ensure the information was not being sought from other government agencies.

Over 100 companies are fighting the measure, among them IBM. The Armonk firm filed a joint complaint with R.J. Reynolds Co. in District Court, Southern District of N.Y. in February.

The complaint alleged the FTC lacks the authority to require line-of-business reporting and asked the court to rule the procedure violates the constitution. In addition, the complaint sought an injunction to bar the release of any information obtained from these reports.

Under the program, firms are asked to disclose their sales and profits by each line of business rather than company-wide.

Calcomp Moving ATL to California

ANAHEIM, Calif. – California Computer Products, Inc. (Calcomp) is moving its Automated Tape Library (ATL) engineering and manufacturing operations to Anaheim from its Boulder, Colo., facility.

The move "will result in considerable facility cost savings," according to Lester L. Kilpatrick, Calcomp president, who added he does not expect the move to cause any significant delay in delivery of ATL systems.

The move is scheduled to be completed by Sept. 30.

Burroughs Nets Aussie Order

CANBERRA, Australia – Burroughs Corp. has received an order for a large B7700 from the Australian Public Service Board.

The system, valued at $5 million, will be linked with terminals throughout the country to provide access to records on personnel and organizations.

The departments of public service in personnel and organization control will be the users of the system, as well as the Australian Treasury and Retirement Benefits Office.

Supershorts

Uppster Corp. has signed Idac S.A. as distributor in France.

– – –

Inforex has shipped over 2,000 key-to-disk systems overseas.

Analysts Say

DP Stocks Follow Others in Summer Drop

By Nancy French
Of the CW Staff

Financial analysts who watched computer systems stocks begin to climb sharply in late June, peak during the week of July 11 and plummet a week later agreed the computer stocks have followed the basic pattern set by the rest of the market.

There, typified by the Dow Jones Industrials, stock prices dropped sharply, with selling triggered by continuing recession, threats of higher energy prices and inflation.

Computerworld's index of computer systems stocks showed a climb from 102 on June 19 to nearly 120 on July 17. As of August 21, it had hit 94.

Analysts disagreed on the subject of performance. Bernard Dorshow, a computer specialist with Lehman Brothers and Harry Edelson, a senior analyst at Drexel Burnham & Co. said the computer stocks were even underperforming the market.

Bob Golden, an analyst with Shearson Hayden Stone, Inc., disagreed, saying the rest of the stock market is doing equally poorly.

"And within the computer framework, there are some divergences, in that IBM is down rather sharply in spite of its good performance, whereas some of the other stocks which are in worse shape on a performance basis or not down enough," he said.

However, there was no disagreement over the effect of Xerox's decision to leave the mainframe business. All said it "may have caused an initial flurry of selling," and Golden added the demise of Xerox Corp.'s Data Systems Division may have "raised questions about the disappearance of still another of IBM's competitors," providing more grist for the Justice Department's antitrust suit against IBM.

However, the announcement had little effect on buyers and sellers of stock.

"If it had, everybody would be buying IBM now, and they're not," Edelson pointed out.

On an immediate basis, the Xerox announcement may have affected the price of a few stocks of companies about which many people are already asking questions, such as Honeywell and Control Data Corp., Golden said.

Both Golden and Dorshow agreed, however, that, had a similar decision been announced by Control Data Corp. Honeywell or Univac, for example, the impact would have been considerable.

"The basic principle we see acting here is typical of a down market," Golden said. If there's any question at all about the quality of a stock, its price will drop during a down period, and that principle could be applied to almost every computer company, including IBM, he said.

Both Dorshow and Edelson linked two other factors to the general downturn of the computer stocks:

The worldwide recession, which has affected the multinationals with special severity, and the theory that computer stocks in general tend to rise and fall with the fortunes of IBM.

"And a number of factors have affected IBM's fortunes this year," Edelson contended.

First, he cited the Justice Department's antitrust suit against IBM and, second the company's relatively lackluster earnings, which are considered typical performance during the winddown of a product cycle – in this case, the System 370.

Secondly, Edelson noted the Employee Retirement Income Security Act – a pension law passed this year – which asks fund managers to keep stock volumes at "prudent" levels.

Other fund managers have come under Congressional criticism for overemphasizing the upper tier of "favored-50 stocks" in building their portfolios to the exclusion of the rest of the market, Golden said.

Banks and funds have become sensitive to this criticism and, as a result have sold large blocks of IBM, eroding the price and bringing about a considerable redistribution of the stock, Edelson explained.

Edleson, however, sees this circumstance as "bullish" for IBM, and, therefore, "bullish" for the computer stocks in general.

"I think they are forming the base here for IBM. If banks, insurance companies and funds had kept their holdings of IBM. I wouldn't have thought so, but because many have cut back from, say, 10% of their portfolios consisting of IBM to, say, only 5%, they can buy in again without being 'imprudent.' "

This redistribution process will probably end "very soon," Edelson predicted, and IBM will again sell on the fundamentals.

(Continued on Page 66)

Caravan '76 Planning to Visit Same Nine Cities as in 1972

NEWTON, Mass. – The '76 Computer Caravan is preparing to roll on a nine-city tour that will stop at the same cities as the original Caravan in 1972.

Included on the tour are four cities the Caravan did not visit last year: Boston, Detroit, Dallas and Washington, D.C.

Starting in Boston March 2, the exhibit, sponsored by Computerworld, Inc., will proceed to the N.Y. Coliseum March 9-11, then on to the Sheraton Park Hotel in Washington March 16-18.

March 23-25 the Caravan will be at the Atlanta Merchandise Mart, and on to Detroit's Cobo Hall March 30-April 1.

After a break week, the show appears in Chicago at McCormick Place and then heads south to the Dallas Market Center April 20-22.

The West Coast stops are at Los Angeles' Convention Center May 4-6 and San Francisco's Civic Auditorium May 11-13.

Attendance is expected to increase by about 10%, putting the number over 35,000, said Avery Blake, president of The Conference Company, a division of Computerworld, Inc. that manages the Caravan.

Last year there were about 60 exhibitors, he added.

The 1976 Caravan offers several new packages in addition to the nine-city tour. Exhibitors can sign up for regional tours featuring four cities on the East Coast, two on the West Coast or three in the Midwest, as well as the major city tour of New York, Chicago and Los Angeles. In addition, he said, exhibitors can add on specified cities to whatever package they choose.

In addition, the Data Comm '76 add-on option allows exhibitors interested in both markets to take advantage of the economical turnkey approach of the Caravan and apply it to Data Comm '76, Blake said.

This feature enables exhibitors to add the Data Comm '76 exhibit in New Orleans Feb. 16-18 at the Rivergate Convention Center to their Caravan schedule.

There is a definite trend, in that previous exhibitors are increasing their booth commitments, Blake added.

Forum Topics

A new group of topics has been selected for the three-day series of user-oriented forums held in conjunction with the exhibits.

The topics include management overview on the first day, software on the second day and computer networks on the final day.

There are four concurrent workshops conducted by users each day. These will be repeated twice in the mornings so attendees can listen to a variety of topics.

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From 612K to 768K	2,680	2,115	1,739	1,512
From 512K to 1024K	5,360	3,600	2,868	2,444
From 1024K to 2048K	11,210	6,412	5,214	4,404
370/158 Memory				
From 1.0 (Mb) to 2.0 (Mb)	$ 5,720	$4,436	$3,624	$3,061
From 1.5 (Mb) to 3.0 (Mb)	9,670	6,197	5,058	4,272
From 2.0 (Mb) to 3.0 (Mb)	6,810	4,542	3,938	3,364
From 1 (Mb) to 2.0 (Mb) 158-3*	9,720	8,317	6,829	5,704
From 2 (Mb) to 3.0 (Mb) 158-3*	10,810	8,516	6,823	5,962

*Lease prices include memory and CPU upgrade to 370/158 Model 3.

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GA Reorganizes in Wake Of Management Changes

ANAHEIM, Calif. – In the wake of the management shuffle at General Automation Inc, (GA), five functional profit and loss groups have been formed including customer service, products, systems and international and subsidiary groups as well as a domestic sales division.

Chairman Lawrence A. Goshorn, who has stepped into the additional roles of president and vice-president following the resignations of Raymond Noorda and Michael Ford respectively [CW, Aug. 27], made the announcement.

A Systems Group has been formed under the direction of group executive George Vosatka, who is in charge of all industrial, communications and data management system marketing, development and manufacturing.

W. Joseph Watson, vice-president of the Products Group, has additional responsibility for marketing and manufacturing of all computer and peripheral products.

All international activities, including the European, Far Eastern and International Distributors Division, have been consolidated into the International Group under the direction of Goshorn.

Jay L. Kear continues as vice-president of sales with responsibility for the Domestic Sales Division.

Richard P. Carroll retains responsibility for all field service, training and technical publications as vice-president of the Customer Service Group.

"All of the organizational changes are in accordance with our continuing plans to structure the company to provide strong financial control over our various lines of business," Goshorn explained.

Qume Gets Financing

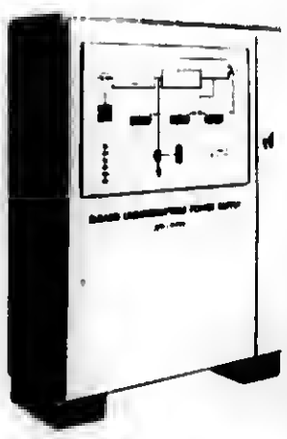
HAYWARD, Calif. – Qume Corp. is planning to increase production of its printers after completing $1.2 million in additional financing.

Qume currently ships over 450 printers a month, the firm said.

The financing includes $680,000 in equity from private investors and a $500,000 addition to a $2 million line of credit with First Pennsylvania Bank.



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Remex Catering to Smaller OEMs for Floppy Business

By Molly Upton
Of the CW Staff

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"We're probably one of the few drive makers looking at the total system all the way back to the software," Walker said.

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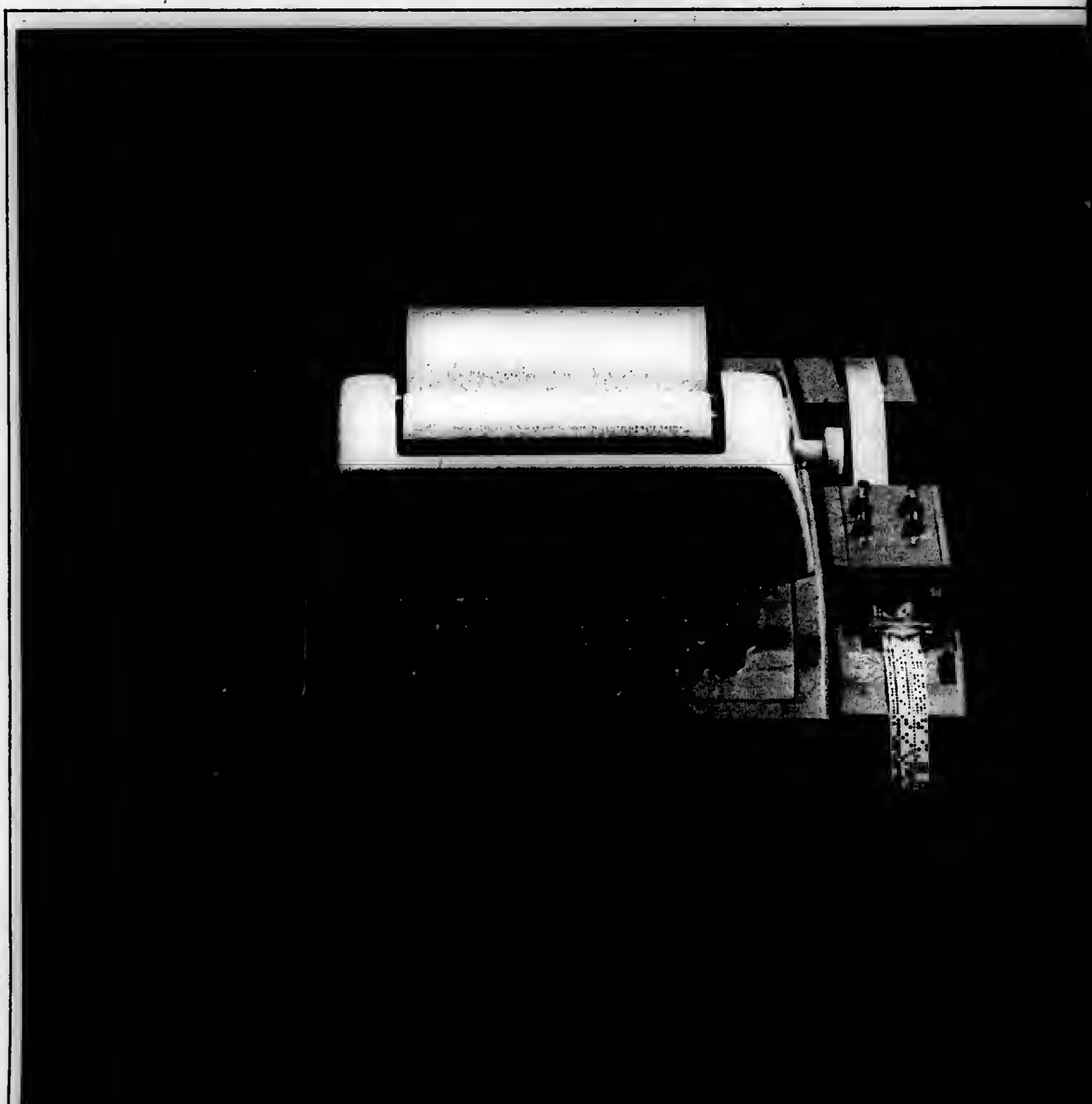
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The heat level is higher at such sites because the units are enclosed to keep out the dirt.

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Remex began its entry into the floppy business with a marketing agreement with Orbis. The agreement also included manufacturing rights to Orbis' Model 74B drive, Walker explained.

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DP Stocks Join Others in Drop

(Continued from Page 63)

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"What's more, interest in technology is temporarily waning," he remarked.

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According to Entrex Head

Source Data Processing on Rise

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"More and more users today are doing all possible DP before that data reaches the mainframe," explained W. Harry Vickers, vice-president of market development and support.

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Although the shared processor data entry market is leveling off, Entrex is still growing, he noted.

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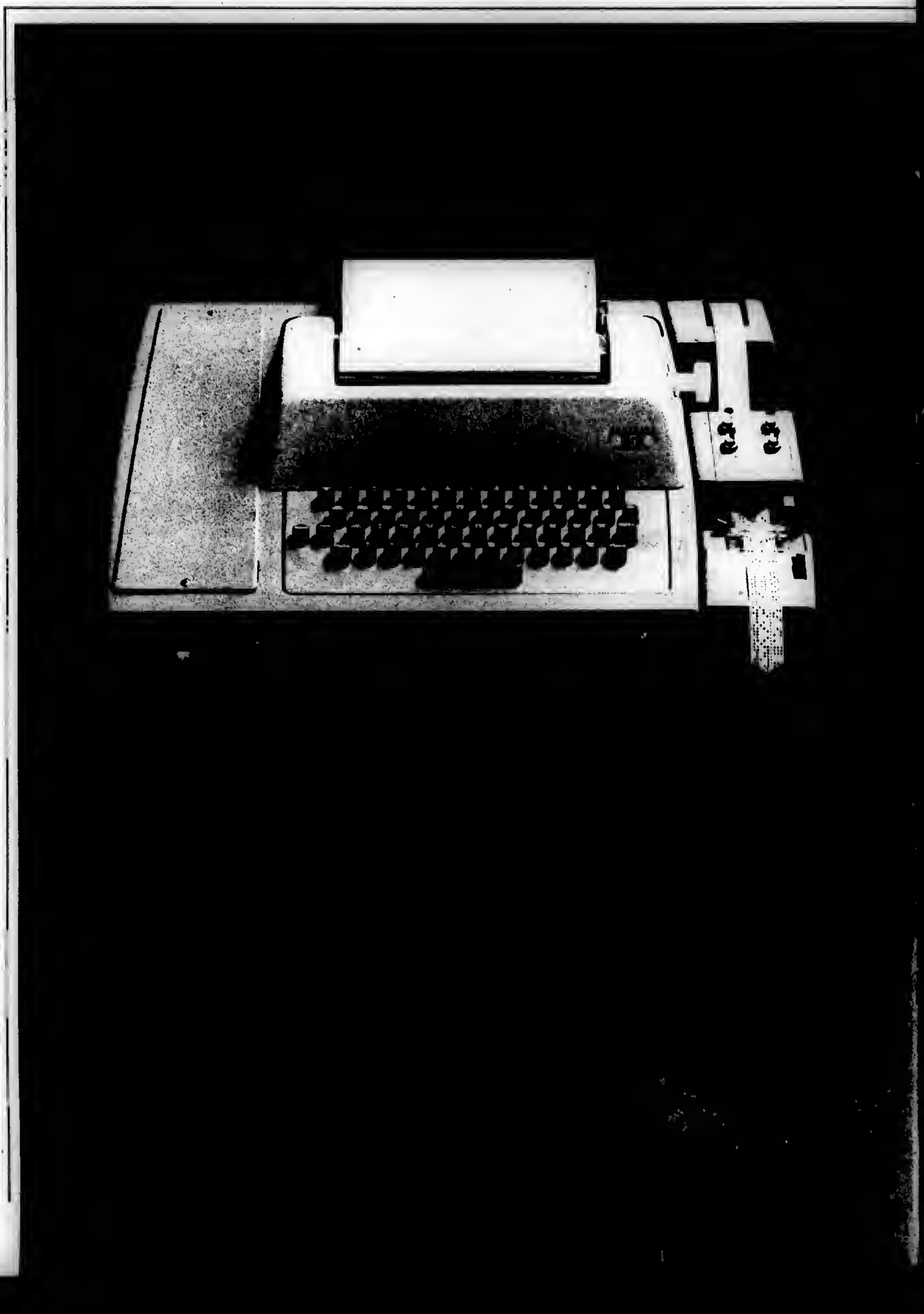
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2-Person-elity	Terse	Insecure	Cordial	Friendly	Semi-Formal
3-Role in Production	Method-Oriented	Do It Myself	Product-ion Oriented	Protect Myself	Results-Oriented
4-Upward/ Downwerd Directed	Up	Up	Down	Up	Both
5-Pro-duction Tectics	Threats	Foreman-ism	Motivate	Hope for Best	By the Book
6-Loss of Employees	Very High	Fairly High	Minimal	Above Average	Minimel
7-Plenning Strategy	Make and Enforce Schedule	Strict Schedule Enforcement	Partici-pative	Somewhat Blue Sky	Much Plenning, Timely Checks

Composite Management Categories

View From Below Shows Manager Should Leave His Quirks Home

By Robert Powers
Special to Computerworld

Although the youth of the DP industry has made it easier to incorporate new concepts in marketing and manufacturing than in older industries, there is still a tremendous need and opportunity for management training.

Within our grasp is the ability to pole vault over the present state of the art in DP. However, it doesn't seem likely that we will be able to do it in our present state of unprepared management.

According to composite management profiles drawn up from 50 first- and second-level managers in about 14 nationally known companies, 60% of front-line management requires some degree of retraining.

We can do better than this.

The management profiles, drawn from both hardware and software fields, fell fairly evenly into five composite characterizations of Al, Bob, Carl, Dave and Ed (see the chart at the left).

They are judged not on neatness, clarity and aptness of thought, but on matters considered to be important to the people who work for them.

In category one, attainment of the position itself, the Als and Daves reached management through political means – some through power plays, others selected from above with the hope of an unhesitating yes vote whenever required.

Bob is a classic example of promoting the most technically competent person as a result of reorganization or an unexpectedly large expansion. Unfortunately, two voids are created in the single move. Not only is the best source of technical expertise lost to that capacity, but a manager is created who must look up the word in the dictionary.

Carl, having both technical and managerial training, is a good and obvious choice. Even if there is need for him to train a technically competent replacement, there is time because the managerial skills are already present, providing the freedom to do so.

Ed is a strange bird. Competent in managerial abilities, but in touch only with the physical work at hand in a more academic sense, he must employ higher level management techniques in his lower level position.

Healthy Work Environment

At category two, personality, Carl and Ed treat the people working for them with professional courtesy and respect – a great psychological asset for them, creating a healthy working environment.

Dave carries around an "I'm one of the guys" sign, giving off an aura of not quite being ready for a leadership position.

Bob feels even less secure in a leadership role, but John Wayne would be proud of the way he conceals it.

Al doesn't have much time for his people socially. A sort of class consciousness permeates the "I'm always right" attitude of this personality.

Category three is the attitude with which these leaders view their part in the job at hand.

Both the Als and the Bobs are unable to delegate authority, but for different reasons. Al wants assurance things will be done his way, for fear of loss of power.

Bob, however, is forever convinced that no one can do the job better than he.

While both slow the job with this policy, Bob does more damage because he needs to be involved in more minute detail.

Dave has an unhealthy concept of his role in prdouction. Concerned more with his reputation than his responsibilities, he jeopardizes both.

Carl and Ed are somewhat alike here. Both believe they and their troops have a mutual goal of finally popping whatever is under development out of the far end of the assembly line.

Ed, however, has an additional goal – to pop "Production 1" out at such a time and in such a way that the home office will remark, "Isn't Ed one hell of a guy?"

Category four is a matter of to whom the manager feels responsible. Al, Bob and Dave take the most popular choice of the buttered side of the bread.

The interest is not just to deliver upstairs the product made in the basement but, more importantly to these three, to measure the oval office for size – their size.

Carl considers himself as representative of his workers and Ed feels a sense of responsibility to both his own management and his work force for various reasons.

(Continued on Page 69)



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After Year-Long Bid Evaluation

Univac Lands $14.5 Million Contract From L.A. County

LOS ANGELES – Univac has landed an order for systems valued at about $14.5 million from the County of Los Angeles.

The award came after a year-long evaluation of bids submitted by 17 computer and peripheral equipment manufacturers. Evaluations were performed by three independent consultants and 11 organizations from the county, state and federal governments.

Two Univac 1110 multiprocessors in a two-by-two configuration will be installed in the Welfare and General Government computer centers along with line printers, tape and disk drives and communications controllers.

The CPUs are scheduled for installation in October and mid-1976. Eligibility determination, one of the initial applications to go on-line in the Welfare Computer Center, is scheduled to be operational next May.

The General Government conversion is scheduled to be completed by November 1976.

One 1110 CPU will monitor and control nearly 1.5 million active individuals on Welfare and provide information, when needed, on about three million other individuals.

The system will also print purchase authorizations for food stamps, issue Welfare warrants and automate many procedures for determining the eligibility of applicants.

When the communications network is completed next spring, the computer will be accessed by 562 Uniscope terminals located in 62 neighborhood Welfare offices from Long Beach to the Mojave Desert.

Some of the departments to be serviced by the second 1110, which will be installed in the county's General Government Computer Center, include auditor-controller, register recorder, assessor, tax collector, child support, purchasing and stores, chief administration officer, forester and fire warden and mechanical and personnel (for payroll).

The Transaction Interface Program will not only check passwords but the physical identifications of terminals to validate their access to the system, Univac said.

The Communications Management System software will log each transaction as it enters the system in the event recovery is necessary.

Commenting on what is believed to be the largest civil government contract ever negotiated in the state of California, Los Angeles DP director Robert A. Best said, "More than 400 different evaluation criteria were applied in measuring the capabilities of the equipment and software proposed by the bidders.

"When all the tests were completed, we found Sperry Univac offered the most cost-effective total system solution to the county's Welfare and General Government needs."

"Being selected as the vendor for this major procurement, after an extremely thorough and objective analysis by the County of Los Angeles and the state and federal governments, is something we prize very much," said C.R. Williams, vice-president and general manager of western operations for Univac.

The General Government computer center for the county currently uses Burroughs, Univac and IBM equipment to write payroll warrants and prepare the assessor's role, tax bills and other documents as well as process elections.

The Welfare Computer Center currently uses Honeywell equipment.

The 1110s will replace a Honeywell 3200, a Burroughs B3500, two Univac (RCA) Series 70/45 and one 70/35. They will also be taking some of the workload off an IBM 360/40, Univac said.

To give an idea of the workload, the county, with a 1974 population of 7.1 million people, accounts for about 34% of the total population of California and is larger than 41 of the 50 states.

DP Managers Should Leave Quirks Home

(Continued from Page 68)

Category five is the methodology employed. Al and Bob employ somewhat similar tactics as dictatorial foremen. While Bob's bark is loud and hollow, Al would not hesitate to fire employees, even for the sake of making an example.

Carl endeavors to motivate the work force individually and collectively, then give them the ball, confident of their ability.

Dave is all but inept in this area. Wishing has little to do with production, but the Daves will probably maintain their management positions for the same reasons they were given them.

Ed expects and usually receives work on time, taking it upon himself to remove what obstacles he can. Ed, however, takes a long time to recover when an unusual situation occurs.

Category six may be guessed at quite easily. Note the relationship between categories six and two.

Al, Bob and Dave lose a lot of employees, Carl and Ed very few. It should be pointed out that personality alone is not the only factor.

Some managers "encourage" several employees to leave when they can't be used to build "their kind of structure."

In work scheduling, those who will do the actual work schedule it in Carl's and Ed's groups. Carl's group also discusses the types and approaches to projects before final scheduling.

Dave's schedules are, at best, watery and unrealistic. Work is done toward unrealistic goals, however, so as not to inherit scapegoat status.

Al and Bob once again resort to authoritarianism. Each of the frequent status reports is considered a deadline. Often, in Al's group, the time duration scheduled for milestones is not even discussed with the employee.

We are an industry of highly skilled professionals. We are also human beings who require more from our efforts than money for groceries and house payments.

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Orders & Installations

United Computing Systems, Inc. has ordered three models from Control Data Corp.'s Cyber 170 series, a 175 and two 174s, to be installed at its data center in Kansas City, Mo. The 175 will be delivered this year, the 174s in 1976.

North East Services Co., Inc. has installed a mid-range System 380 key-to-disk system from Entrex, Inc.

The Reader's Digest is replacing existing disk drives supplied by several vendors with a four-control unit, 16-drive complement of Itel 3330-compatible drives.

United Air Lines has ordered California Computer Products, Inc. 1030 disk controllers and 230 disk memories for use in its passenger reservations system.

Manufacturers Hanover Trust Co. has ordered 78 Sycor 250 intelligent display stations and 30 printers for use in its securities handling areas.

The Nutmeg Bakers Supply Co. of New Haven, Conn., is the first installation of IBM's System/32 Wholesale Food Distribution Accounting and Management System.

Tucson Data Center, Inc. has ordered a Burroughs B3700 to provide on-line DP services for 42 credit unions throughout Arizona.

Marine Midland Services Corp., the DP services arm of Marine Midland Bank, has ordered a 24K ICL 2903 computer system from International Computers Ltd. for use by its International Banking Division in New York.

The Long Beach, Calif., Community Hospital has ordered an HP3000 Model 300 CX computer system from Hewlett-Packard Co. to handle patient record-keeping and billing, personnel records and other administrative and medical tasks.

Wire CRT Chassis Gives Titchener High Hopes for Market Capture

BINGHAMTON, N.Y. – CRT manufacturers are finding they can save money, time and space by using welded wire chassis instead of solid metal enclosures.

Developed by the E.H. Titchener Co. here, the technique enables the electronics to be mounted on a custom-designed frame. A cabinet is then dropped over the frame.

The open wire frame ends heat problems and eliminates the need for cooling fans, according to Ed Wayne, vice-president of research and development at Titchener.

Frame weight is cut approximately one-third, he said, and customer studies show components can be positioned on the chassis and tested 20% to 25% faster.



Shown here, at left, is the wire chassis for a Bunker-Ramo terminal. Once the components have been placed on it, the tube is added and the cabinet dropped over it to finish the assembly.

Lower cost, reduced dimensions and ease of servicing in the field are additional attributes claimed for the new systems.

"Surveys tell us applications for CRT terminals are expected to increase 300% within the next two years alone," Bob Lindridge, manager of sales, said.

"Quite frankly, with all its advantages, we expect the steel wire chassis to just about capture this market totally. This year we'll be producing some 20,000 units, and the frame's penetration of the field is only beginning," he said.

35% Savings Claimed

Raytheon is saving 35% by using the wire frame chassis instead of the solid metal version in its airlines reservations terminals, Titchener said. Bunker-Ramo (BR) reported the wire chassis is 15% less expensive and expedites assembly time by 20%. BR uses the frames in its desktop stock quotation terminal.

Hazeltine Corp., Computer Optics and Redactron Corp. are other users.

In most cases, the parts-holding chassis is manufactured of bright basic wire, 1/8-in. to 3/16-in. in diameter, and coated to afford corrosion protection and a shiny, chrome-like surface. Cold-rolled strip steel and stampings are welded onto the chassis to provide mounting studs and screw holes for holding the electronic gear.

Circuit boards are mounted with permanent fasteners or plastic snap locks which permit the boards to be popped out and replaced. The picture tube is normally bolted to four stampings with weld studs, and the power transformers affixed to a heavier stamping on the bottom of the frame for a lower center of gravity.

DDS Clearinghouse To Market Software For Interdata Systems

TUCSON, Ariz. – Diversified Data Systems, Inc. (DDS), a systems and software firm marketing a Cobol compiler for Interdata computers, intends to become a clearinghouse for independently written software that operates on Interdata 16-bit and 32-bit computers.

"The Interdata users group has a lot of good software available which is free to Interdata users," said Rick Dural, vice-president of marketing for DDS, "but there are many software packages written for Interdata computers whose authors are not willing to supply without charge.

"The expense of marketing a package which might sell for $2,500 or less, however, would be prohibitive for most small companies or individuals who develop software but do not maintain marketing organizations," he said.

The authoring firm will handle the technical support of the package, should any be required.

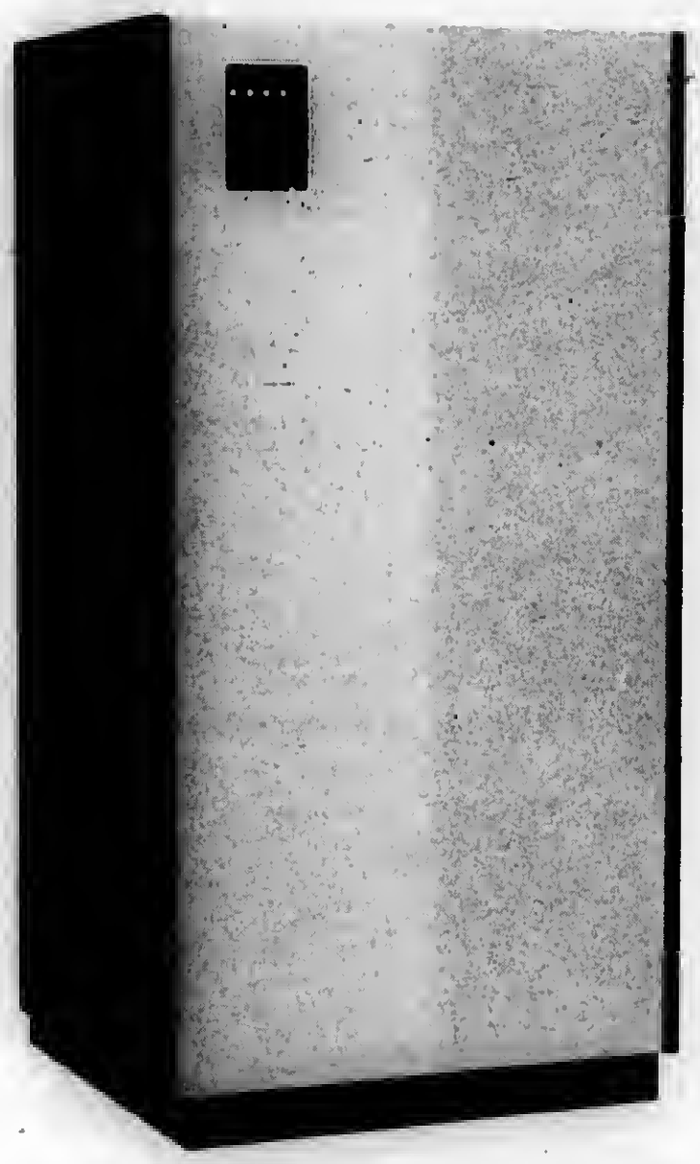


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Furthermore, the 1380 has a flexible disc for program loading (independent of the CPU) and off-line testing. Our diagnostics don't interrupt processing.

Network management functions include dynamic line control, line statistics reporting, line monitoring, and down-line diagnostics via the operator CRT console. Try that on your 3705!

From memory to interfaces, more than a score of modular options are available. The memory expands from 32K bytes to 512K in 8K increments. Channel adapters for both System/360 and System/370 permit attachment to eight CPU's.

A Memorex representative can show why the 1270 and 1380 Communications Controller family is faster, more flexible and more economical.

For details, call your nearest Memorex sales office, located in major cities. Memorex Equipment Products Group, San Tomas at Central Expressway, Santa Clara, California 95052. (408) 987-1000.



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Contracts

Microdata Corp. has received a contract valued at more than $1.4 million from Dymo Graphic Systems, Inc. for Microdata 1600 minicomputers which will be used in automatic photocomposition systems.

Systems and Computer Technology Corp. has received a four-year, $4 million extension of an existing computer center management contract from the Illinois Board of Governors' Cooperative Computer Center.

The Kennedy Co. has been awarded a contract by Harris Communications, Inc. for 9000 series tape transports and Model 9217 formatters.

Okidata Corp. has received a contract from Lear Siegler, Inc. for 500 Okidata 110 char./sec desktop printers, which will become part of the ADM series of display terminal systems. In addition, Lear Siegler will offer maintenance services to Okidata CP110 printers in the U.S.

Uppster Readying Printer for OEMs

HAUPPAUGE, N.Y. – Uppster Corp. said it will begin deliveries of a high-speed nonimpact printer, comparable to IBM's Model 3800, to OEM customers in the U.S. as well as European Common Market countries this month.

The company's Model II xerographic-type printer, which operates at 9,200 line/min will sell in small quantities for $38,000 per unit, according to Edward M. Brown, vice-president of marketing.

The Model II is the culmination of a five-year development effort during which original market estimates of $160 million were vastly increased by IBM's entry into the nonimpact printer market with the Model 3800, Wall Street market forecasters said.

Neither Brown nor Uppster's president Joseph Klockenbrink, was willing to estimate Uppster's potential share of the nonimpact market or the $8.5 billion total printer market.

Foreign sales will be handled under a distribution agreement with Idac S.A., a French corporation, which calls for an irrevocable purchase of $4.6 million of equipment during the initial three years of the agreement.

Mechanical assembly for the first 1,000 units is being done by Hitachi in Japan, and electronics assembly is being subcontracted to "a number of Long Island firms," Brown said.

"Original equipment manufacturers have been contacting us," Klockenbrink said. For the time being, all U.S. sales of the Model II, the company's first product, will be handled by Brown and Klockenbrink, Brown said.

The printer, which makes one copy at a time and can be set to make up to 99 copies per sheet serially, can use any size paper, but Brown expects the 8-1/2-in. by 11-in. size to be the most popular because of the rising cost of paper.

The system will be sold primarily on the basis of price/performance, Brown said.



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Earnings Reports

COMPUSCAN
Year Ended May 31

	1975	a1974
Shr Ernd	$1.00	$.68
Revenue	11,062,000	8,054,000
Tax Cred	492,000	447,000
Earnings	1,473,000	1,044,000
3 Mo Shr	.33	.28
Revenue	3,782,000	2,522,000
Tax Cred	121,000	147,000
Earnings	608,000	392,000

a-Restated.

COMTEN
Three Months Ended June 30

	1975	1974
Shr Ernd	$.10	$.24
Revenue	4,642,636	3,334,905
Tax Cred	109,500	244,406
Earnings	238,288	494,966
6 Mo Shr	.12	.24
Revenue	8,174,395	5,617,280
Tax Cred	134,000	245,000
Earnings	292,139	497,532

DPF
Year Ended May 31

	1975	a1974
Shr Ernd	$1.19	.....
Revenue	25,452,000	$31,527,000
bSpec Cred	4,481,000	1,429,000
Earnings	4,860,000	(3,365,000)
3 Mo Shr	.14	.....
Revenue	5,449,000	8,551,000
bSpec Cred	314,000	378,000
Earnings	571,000	(4,416,000)

a-Restated to conform to current reporting requirements. b-Consists of $2.2 million gain from repurchase of debentures and a tax-loss carryforward credit of $2.27 million in 1975; in 1974, from a tax loss carryforward. For the 1975 quarter, consists of a $316,000 tax credit less a $2,000 loss from repurchase of debentures; in 1974 quarter from repurchase of debentures.

PERTEC
Year Ended June 27

	1975	1974
Shr Ernd	$.90	$.41
Revenue	48,016,000	32,924,000
Disc Op	.....	a(1,041,000)
Tax Cred	.....	262,000
Earnings	2,775,000	1,256,000
3 Mo Shr	.31	b.29
Revenue	13,486,000	9,451,000
Earnings	956,000	880,000

a-Includes $406,000 loss on disposal of discontinued operations. b-Includes gain of $.22 per share from sale of computer output microfilm operations.

RECOGNITION EQUIPMENT
Three Months Ended July 31

	1975	1974
Shr Ernd	$.12	$.40
Revenue	13,465,000	9,543,000
Tax Cred	224,000	252,000
Earnings	733,000	2,084,000
9 Mo Shr	.36	.26
Revenue	42,477,000	28,623,000
Tax Cred	965,000	949,000
Earnings	2,082,000	1,363,000

SCAN-DATA
Three Months Ended June 30

	1975	1974
Shr Ernd	$.04	$.01
Revenue	2,583,726	2,497,995
Tax Cred	21,700	2,763
Earnings	67,488	12,560
6 Mo Shr	.06	.03
Revenue	5,092,934	4,426,045
Tax Cred	42,500	14,234
Earnings	107,345	43,196

F&S Sees Law Enforcement Mart Growing to $25 Billion by 1980

By a CW Staff Writer

NEW YORK – Spending on law enforcement equipment and programs by federal, state and local law enforcement agencies will grow from an estimated $15 billion in 1975 to approximately $25 billion by 1980, according to a recent Frost & Sullivan, Inc. (F&S) market research study.

The Department of Justice and its branches will pay out about $1.9 billion and the Law Enforcement Assistance Administration (LEAA) will spend about $886 million, the report said. Most of the latter is slated for state and local governments.

Within the Department of Justice, the Federal Bureau of Investigation is now spending about $20 million for equipment with half of that earmarked for continuing work on automating the fingerprint system.

Bulk Goes to States

The bulk of LEAA funding, some $480 million, will go to the states on a matching grant basis this year, according to F&S. For its own purposes, the agency is allocating $45 million for technology analysis, development and dissemination, $45 million for manpower development and $26.5 million for data systems and statistical assistance.

The study theorized that the annual funding for LEAA will continue at the $1 billion level for the next five years because of the emphasis on reducing the time gap between arrest and trial. Closing the gap will require the use of automated information systems for such activities as recordkeeping and case and jury selection.

The report also called for special attention to information and communications exchanges among state and local agencies.

There is greater need for research into existing criminal justice systems at state and local levels, particularly into a system's needs and the size of state and local crime problems, the report said.

In addition, law enforcement agencies need more and better information on the types of crimes committed, classification of those arrested, effects of pretrial release and detention and other factors affecting the judicial process, F&S said.

The report suggested researchers explore the existing criminal justice process to develop new crime reduction methods and engineering developments from defense and aerospace industries be studied for adaptation to criminal justice use.



Lining Up for Inspection

CUPERTINO, Calif. – HP-2640 CRTs undergo reliabillty tests at the Hewlett-Paekard Co. plant here as teehnleian Robert Melanson verifies a test program.
Over 1,000 units have been delivered sinee shipments began in January, leadlng to formation of the Terminal Produets Divislon.

DP Directory to List Buyers, Sellers

FRAMINGHAM, Mass. – For those wanting to exchange computer equipment without going through a broker, The Computer Store, Inc. is preparing the *Computer Equipment Directory*.

The directory, which is scheduled to appear monthly, has a subscription rate of $75 a year. Ads are free.

Computer Store may be reached through P.O. Box 2621, 01701.

Ibfi Program Studies Forms, Hardware Link

ARLINGTON, Va. – International Business Forms Industries (Ibfi) has instituted a technical council program to enable manufacturers of forms-using hardware – particularly printers and scanners – to become affiliated with Ibfi for an exchange of mutually relevant technical information.

Examples of the proposcd services include work on image quality standards, furnishing representative test forms, calibration of optical character recognition (OCR) testing devices and forms technology orientation as well as seminars on forms technology, according to Ted Webster, Ibfi technical director.

Webster also discussed the expansion of forms standards through the American National Standards Institute as a response to the lack of American standards in the area of forms.

Thc feasibility of setting up a new Ansi committee under the sponsorship of Ibfi is being studied, he said.

Ibfi is at 1730 North Lynn St., 22209.

Bubble Patent Granted

YORKTOWN HEIGHTS, N.Y. – Dr. John C. Slonczewski of the IBM Research Center here has received a patent for a technique allowing higher storage density of magnetic bubbles.

In the technlque, information is represented by the properties of the domain wall between the bubble and the surrounding magnetic film, rather than by the presence or absence of a bubble.

Slonczewski has devised a way of distinguishing among the different number of turns a magnetic direction makes in one closed path around a bubble, which represents the information stored.

Other IBM researchers are experimenting with the concept to see if it can be developed into the basis for practical computer memories.

Computer Design magazine announces CompDesign 76, a unique, new national supermarket of OEM products, services and information.

CompDesign 76 is a series of OEM product supermarkets that will appear in five cities across the country in conjunction with The 1976 Computer Caravan. Adapting the proven success formula of The Computer Caravan and sharing its facilities, CompDesign 76 will be a self-contained show with Designer Forums, Product Seminars and a complete Exhibition of the latest products and services in The OEM market. It will bring thousands of OEM buyers and sellers together in a unique, information-oriented atmosphere designed for serious business. And it will cover key markets across the country.

Here's the schedule:

Boston	March 2-4, 1976
New York	March 9-11
Chicago	April 13-15
Los Angeles	May 4-6
San Francisco	May 11-13

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As an OEM marketer, you'll find that it's surprisingly easy to become an exhibitor in CompDesign 76, because our show manager, The Conference Company, does much of the work for you. They provide a standard booth or display stand, furniture, set-up and teardown, transportation from city to city, help with your product seminars, all registration procedures — and much more. So it's possible for even the smallest companies to join with industry leaders in effective presentation of their products and services to the industry's decision makers. And the cost can be quite reasonable.

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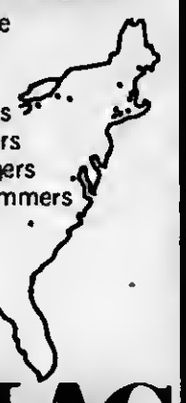
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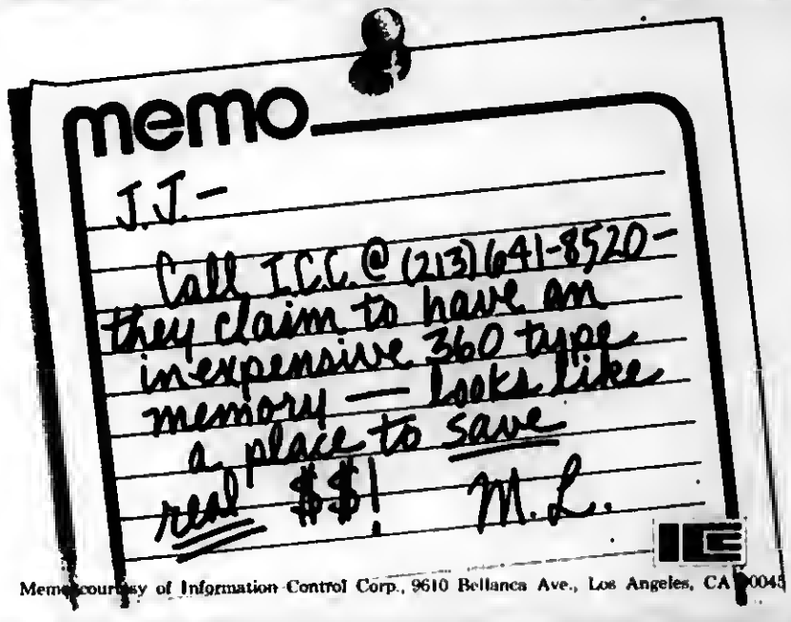
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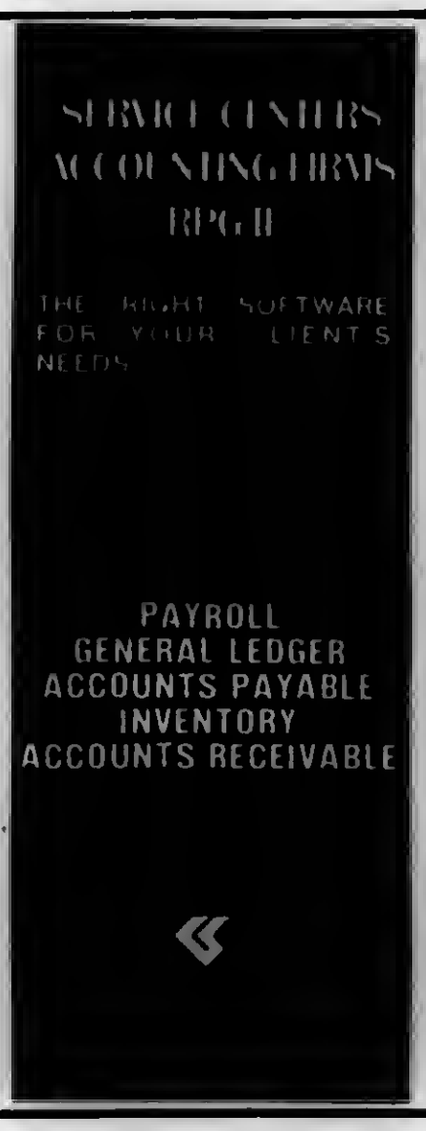
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Datran Factor in $12 Million Half-Year Loss at Wyly

DALLAS – Cash-hungry Wyly Corp. reported a second-quarter loss of $9.5 million and a $12 million loss for the six months ended June 30.

The losses were due primarily to underwriting losses in its insurance subsidiary and operating losses from its Data Transmission Co. (Datran) subsidiary.

Wyly has been attempting to sell its Gulf Insurance subsidiary and said it anticipates such a sale could result in a net loss of $20 million or more and a substantial reduction in debt.

Discussions are continuing with Haefner Holding AG on a possible substantial investment in Wyly stock, the firm said. Haefner has been supplying Datran with interim loans which are expected to satisfy Datran's cash requirements for 1975.

Datran will need additional cash during 1976, which has not yet been arranged, Wyly said.

Wyly changed its accounting methods to conform to new standards for development-stage companies. Datran's operating and other costs, previously deferred, are shown as losses. Wyly's investment in the firm and its shareholder equity were also restated.

The figures for 1974 were also restated to reflect the sale of the Computer Leasing Co., subsidiary and the Energy Division of University Computing Co. (UCC).

Breaking down the quarter, Wyly's consolidated revenues declined to $15.5 million from $21.1 million in the same period last year. The loss grew to $9.5 million or $1.14 a share including a $2.4 million credit from discontinued operations, compared with a loss of $1.8 million or 22 cents a share in the 1974 quarter, which included a $535,000 credit from discontinued operations.

UCC's service operations' income before taxes and corporate costs declined to $1.1 million compared with $2.8 million in the year-ago quarter, while Gulf Insurance lost $6.2 million compared with a $861,000 loss in the 1974 quarter.

Datran contributed a loss of $3 million compared with a $1.5 million loss before taxes and corporate costs in the year-ago period.

Datran's unconsolidated revenues, however, grew to $131,000 in the quarter from $19,000 in the same 1974 period.

Same Picture

During the six months, the picture was much the same.

Consolidated revenues declined to $31 million from $39.9 million in the year-ago and losses grew to $12 million or $1.45 a share, including a $2.8 million credit from discontinued operations.

The loss in the 1974 six months, when there was a $975,000 credit, was $2.4 million or 29 cents a share.

Gulf Insurance lost nearly $6 million in contrast with earnings of $1.9 million in the 1974 half, while Datran showed a deficit of $5.5 million before taxes and costs. A year ago the restated Datran debit was $3.3 million.

UCC Figures

UCC's six-month pretax income totaled $2.8 million compared with $3.7 million in the year-ago half. The 1974 figure included a $1.5 million sale of software to a single customer and profits of $800,000 on a services contract later sold.

UCC revenues for the first half of 1975 totaled $30.8 million from continuing operations.

There was a $2.8 million gain from the sale of three UCC operating units, a service center in Seattle, a custom programming operation in Pennsylvania and its energy group.

"A decision to increase banking product development and to accelerate our scientific/engineering equipment consolidation program is reducing earnings in the first half," Donald G. Thomson, UCC president said.

"But this is expected to produce revenue and profits in 1976, offsetting the loss of profits from those entities sold," he added.

All UCC divisions were profitable at midyear, although the Scientific and Engineering Division experienced significant revenue erosion in the second quarter and the Banking Division reported a loss for that three-month period, he said.

The UCC Commercial Division continued to exceed revenue and profit goals and the Financial Software Group achieved its financial objectives in the first half, he said.

The UCC Scientific and Engineering Division's revenue declined in the early summer months largely because of general economic depression and a resulting decrease in outside procession by clients.

The UCC Banking Division's progress in the first six months showed distinct improvement over the same period a year ago. A program is now under way to develop and market several new banking products to keep this division abreast of trends toward on-line processing, Thomson said.

Net Rises at Decision Data

HORSHAM, Pa. – Despite a sharp drop in second-quarter earnings, Decision Data Computer Corp. managed to show an increase in earnings during the six months ended May 31.

President Loren A. Schultz attributed the second-quarter decline to general economic conditions and especially to the lower order rate experienced in the first quarter.

The original equipment manufacturers (OEM) are deferring decisions on equipment, and a record level of end-user orders was not sufficient to offset the reduced OEM activity, he said.

Deliveries of new products announced in May will begin in the third quarter, he added.

During the quarter, the firm earned $68,000 or 2 cents a share, reflecting a tax credit of $99,000. This compares with earnings of $270,000 or 7 cents a share in the year-ago period, when there was a $128,000 credit.

Revenues grew to $11.2 million compared with $9.9 million in the 1974 quarter.

For the six months, however, earnings rose to $493,000 or 13 cents a share compared with $411,000 or 11 cents a share. The credits were $261,000 and $194,000 respectively.

Revenues during the half expanded to $22.8 million compared with $17.2 million a year ago.

Scan-Data Results Up in 6 Months

NORRISTOWN, Pa. – Scan-Data Corp.'s earnings and revenues increased for the second-quarter and six-month periods ended June 30.

Earnings for the quarter jumped to $67,488 or 4 cents a share compared with $12,560 or 1 cent a share in the same period last year. Tax credits for 1975 totaled $21,700 compared with $2,763 in the year-ago quarter.

$2.6 Million Revenues

Revenues rose to $2.6 million compared with $2.5 million in the same 1974 quarter.

In the six months, earnings grew to $107,345 or 6 cents a share including a $42,500 tax credit compared with $43,196 or 3 cents a share, including a $14,234 credit, in the year-ago period.

Revenues totaled $5.1 million compared with $4.4 million in the same period last year.

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Earnings Reports

DIGITAL EQUIPMENT
Year Ended June 28

	1975	1974
Shr Ernd	3.85	3.80
Revenue	533,774,000	421,884,000
Earnings	46,000,000	44,400,000
3 Mo Shr	1.46	1.36
Revenue	160,542,000	135,199,000
Eernings	17,420,000	15,981,000

ELECTRONIC DATA SYSTEMS
Year Ended June 30

	1975	1974
Shr Ernd	$1.21	$1.28
Revenue	123,896,000	118,734,000
Earnings	14,648,000	15,349,000

MANAGEMENT ASSISTANCE
Three Months Ended June 30

	1975	1974
Shr Ernd	$.07	$.04
Revenue	24,272,000	19,996,000
Tax Cred	818,000	652,000
Earnings	1,940,000	1,151,000
9 Mo Shr	.14	.06
Revenue	69,067,000	55,855,000
aSpec Cred	928,000	1,126,000
Earnings	4,068,000	1,663,000

a-Consists of $592,000 loss from write-off of settlement agreement and a gain of $1.5 million from tax-loss carryforward in 1975; in 1974, from tax-loss carryforward.

GREYHOUND COMPUTER
Three Months Ended June 30

	a1975	1974
Shr Ernd	$.02	$.07
Revenue	15,338,000	13,675,000
Earnings	91,000	308,000
6 Mo Shr	.03	.17
Revenue	31,170,000	26,469,000
Earnings	140,000	746,000

a-Includes results of Computer Leasing Co. from purchese date of Dec. 31, 1974.

HAZELTINE
Three Months Ended June 30

	1975	a1974
Shr Ernd	.....	$.03
Revenue	$21,278,000	22,670,000
Earnings	(325,000)	64,000
6 Mo Shr	.....	.10
Revenue	38,306,000	50,904,000
Spec Chg	.....	b680,000
Loss	1,365,000	494,000

e-Restated. b-Cumulative effect of accounting change.

MILGO ELECTRONIC
Three Months Ended June 30

	1975	1974
Shr Ernd	$.51	e$.44
Revenue	8,868,000	8,950,000
Eernings	861,000	734,000
9 Mo Shr	1.94	a1.28
Revenue	29,419,000	22,579,000
Earnings	3,255,000	2,118,000

a-Adjusted for 5% stock dividend in Februery 1975.

SIEMENS AG
eNine Months Ended June 30

	1975 (000)	1974 (000)
Revenue	$5,100,200	$4,672,900
Eernings	135,900	133,600

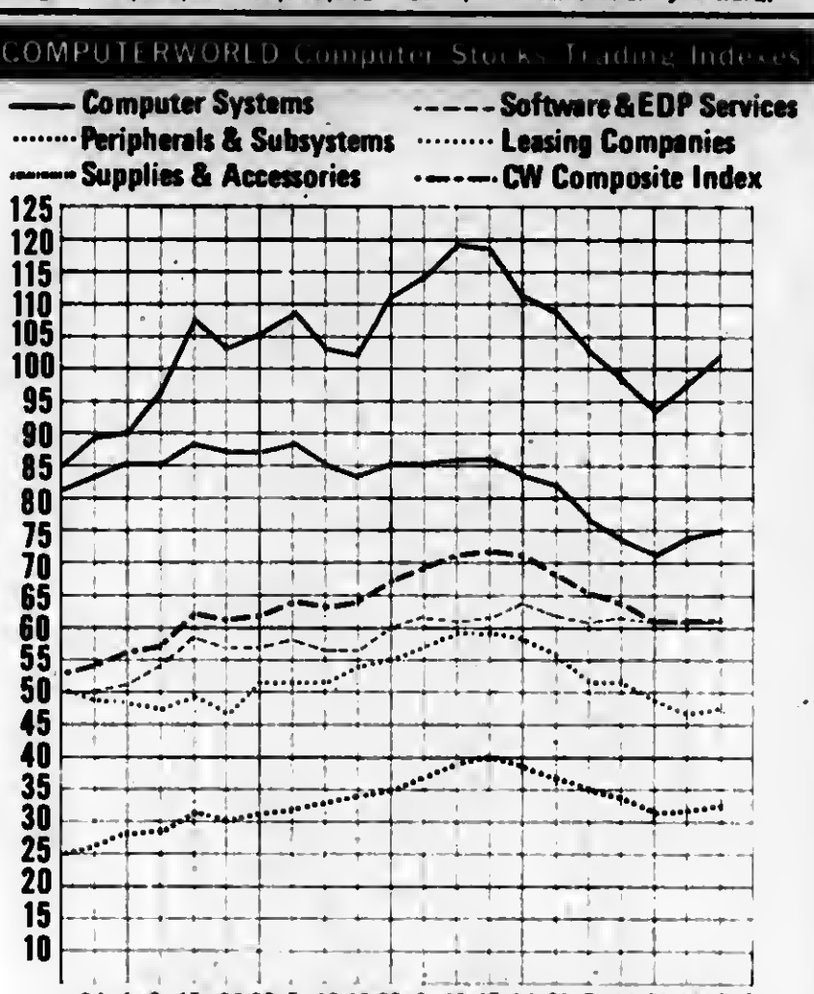
a-The above figures heve been computed at the mark's current rate.

SINGER
Three Months Ended June 30

	1975 (000)	1974 (000)
Shr Ernd	a.....	$.80
Revenue	$628,550	650,182
Disc Op	.....	(2,757)
Earnings	1,129	15,138
6 Mo Shr	.....	1.68
Revenue	1,293,614	1,292,578
Disc Op	.....	(5,992)
Earnings	(2,566)	31,815

a-No common share earnings shown; preferred dividend requirements exceeded net income.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 3, 1975

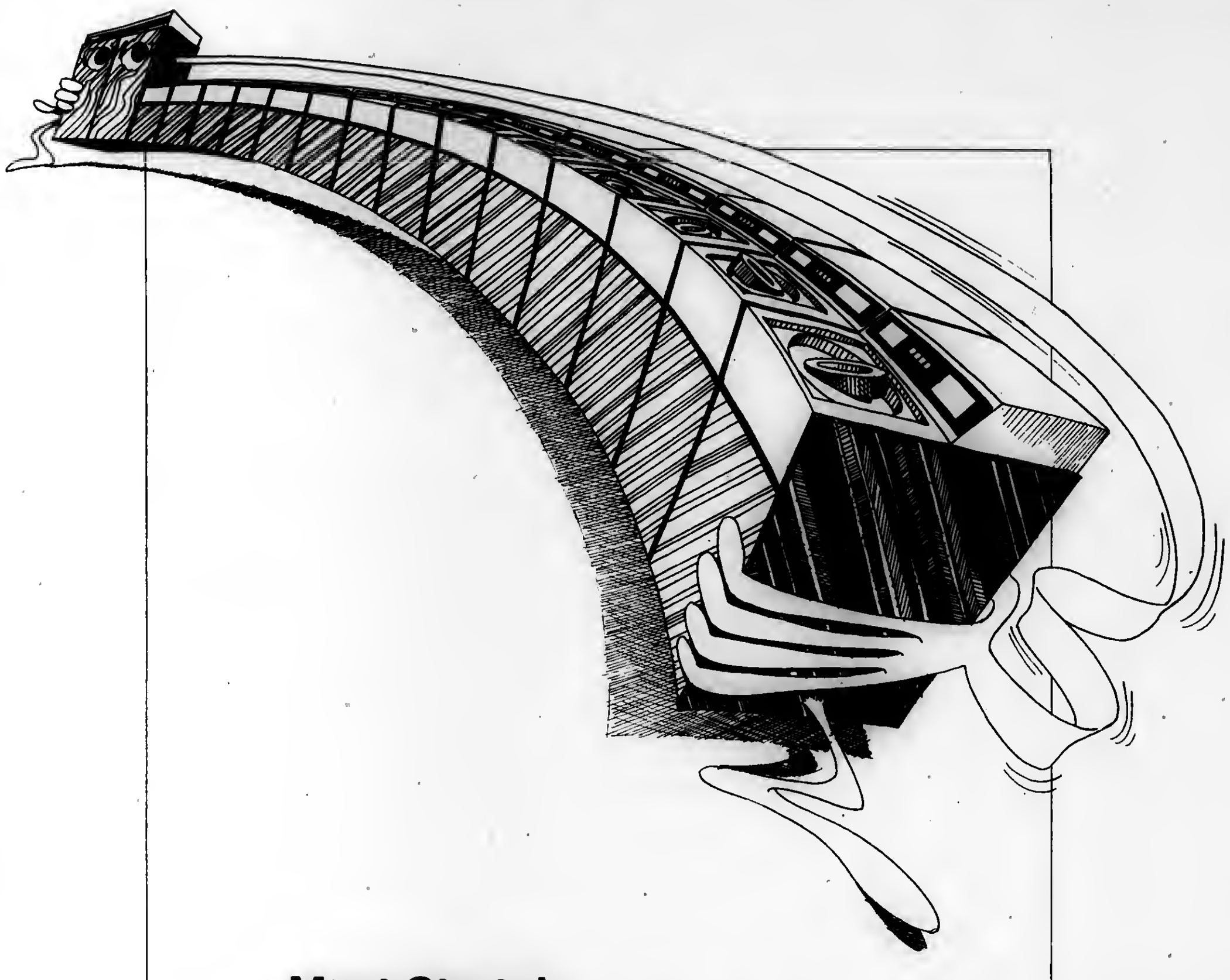
All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

F X C H		1975 RANGE (1)	CLOSE SEP 3 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	67-109	90 3/4	+2 1/8	+2.3
O	COMPUTER AUTOMATION	2- 10	8 5/8	+ 5/8	+7.8
N	CONTROL DATA CORP	11- 23	17	+ 3/4	+4.6
N	DATA GENERAL CORP	10- 38	29	+1 3/4	+6.4
O	DATAPOINT CORP	6- 26	20 3/4	+3	+16.9
C	DIGITAL COMP CONTROL	1- 4	3 1/2	+ 1/4	+7.6
N	DIGITAL EQUIPMENT	46-122	113 5/8	+3	+2.7
N	ELECTRONIC ASSOC.	2- 3	2 1/2	+ 1/8	+5.2
A	ELECTRONIC ENGINEER.	5- 10	8 3/4	+ 1/8	+1.4
N	FOXBORO	23- 42	30	- 3/4	-2.4
O	GENERAL AUTOMATION	6- 14	9 1/8	+1 1/4	+16.1
C	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	58-120	91 3/8	-1 1/8	-1.2
N	HONEYWELL INC	22- 43	30	+1 7/8	+6.6
N	IBM	158-224	182 3/4	+1 3/4	+0.9
C	MEMOREX	1- 10	7 1/4	+ 1/4	+3.5
O	MICRODATA CORP	2- 6	5 3/8	+ 3/4	+16.2
O	MODULAR COMPUTER SYS	5- 19	12 1/4	+1 3/4	+16.6
N	NCR	15- 33	28 1/4	+1 3/8	+5.1
O	PRIME COMPUTER INC	2- 6	5 1/4	+ 1/4	+5.0
N	PERKIN-ELMER	16- 30	24 1/2	+1	+4.2
N	PAYMASTER CO	26- 59	51 3/4	+2	+4.0
N	SINGER COMPANY	10- 17	12 1/2	+ 1/4	+2.0
N	SPERRY RAND	26- 49	39 3/4	- 1/2	-1.2
A	SYSTEMS ENG. LABS	1- 5	3 3/8	+ 1/4	+8.0
O	ULTIMATE SYSTEMS INC	1- 6	5 5/8	0	0.0
N	VARIAN ASSOCIATES	7- 18	14 3/8	+1	+7.4
N	WANG LABS.	7- 17	12	+ 1/4	+2.1
N	XEROX CORP	51- 86	56 7/8	-1 1/8	-1.9
	LEASING COMPANIES				
O	CENTISCO INC	1- 5	3 3/8	0	0.0
A	CLARENCE GROUP CORP	2- 4	3	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	5/8	-	-8.2
N	CATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	1- 1	1/2	0	0.0
N	DPF INC	3- 6	4 3/4	+ 1/4	+5.5
O	ECP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	3 3/4	+ 1/4	+7.1
A	GREYHOUND COMPUTER	2- 3	2 7/8	0	0.0
A	ITEL	3- 9	6 1/8	+ 1/4	+4.2
N	LEASCO CORP	4- 8	5 5/8	- 3/8	-6.2
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NPC INC	1- 4	2 3/8	0	0.0
A	PIONEER TEX CORP	2- 7	4 3/4	- 1/4	-5.0
A	ROCKWOOD COMPUTER	1- 1	1/4	0	0.0
N	U.S. LEASING	8- 14	7 7/8	-1	-11.2

E X C H		1975 RANGE (1)	CLOSE SEP 3 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	1	0	0.0
A	APPLIED DATA RES.	1- 10	1 3/4	0	0.0
N	AUTOMATIC DATA PROC	29- 65	52 3/8	+ 3/4	+1.4
O	BRANDON APPLIED SYST	1- 1	1/8	- 1/8	-50.0
O	CENTRAL DATA SYSTEMS	3- 7	6 5/8	+ 1/8	+1.9
O	COMPUTER DIMENSIONS	2- 6	4	0	0.0
O	COMP ELECTION SYSTMS	3- 6	5 1/2	+ 1/4	+4.7
O	COMPUTER HORIZONS	1- 1	3/4	0	0.0
O	COMPUTER NETWORK	1- 3	2 1/4	- 1/8	-5.2
N	COMPUTER SCIENCES	2- 6	5 1/4	+ 3/4	+16.6
O	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
O	COMPUTER USAGE	2- 4	2 1/4	- 1/8	-5.2
O	COMSHARE	3- 4	2 7/8	+ 1/8	+4.5
O	DATATAB	1- 9	1 5/8	- 1/8	-7.1
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 29	17 3/4	- 1/2	-2.7
O	INFORMATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	3/4	0	0.0
O	KRANE ASSOCIATES	2- 3	2 1/4	0	0.0
O	KEYDATA CORP	2- 3	2 1/2	0	0.0
C	LOGICON	3- 5	3 3/4	+ 1/8	+3.4
A	MANAGEMENT DATA	1- 3	1 7/8	+ 1/8	+7.1
O	NATIONAL CSS INC	6- 14	12 3/4	+ 3/4	+6.2
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	13 3/4	+ 1/2	+3.7
N	PLANNING RESEARCH	2- 6	4	+ 1/8	+3.2
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	3 7/8	+ 1/4	+6.8
C	REYNOLDS & REYNOLD	13- 24	11	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	7/8	+ 1/8	+16.6
O	TYMSHARE INC	7- 21	19 1/8	+2 3/4	+16.7
A	UPS SYSTEMS	2- 4	3 1/8	+ 1/8	+4.1
N	WYLY CORP	2- 4	3	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ACCESSGRAPH-MULT	4- 9	6 7/8	+ 3/8	+5.7
O	ADVANCED MEMORY SYS	1- 7	4 1/2	+ 1/2	+12.5
N	AMPEX CORP	3- 7	5 1/2	+ 3/8	+7.3
O	ANDERSON JACOBSON	1- 3	2 1/4	+ 3/8	+20.0
C	ARCHIVE MEDICAL ELEC	1- 5	3	0	0.0
A	BOLT,BERANEK & NEW	5- 13	10 3/8	+ 3/8	+3.7
N	BUNKER-RAMO	4- 8	4 5/8	0	0.0
A	CALCOMP	4- 7	4	0	0.0
O	CAMBRIDGE MEMORICS	3- 5	3 3/4	0	0.0
N	CENTRONICS DATA COMP	7- 25	16	+ 3/4	+4.9
O	CODEX CORP	15- 38	33 1/2	+4 1/4	+14.5
O	CODITRONICS	1- 2	1	- 1/8	-11.1
O	COMPUTER COMMUN.	1- 2	1	0	0.0
O	COMPUTER CONSOLES	3- 7	3 3/4	- 1/2	-11.7
A	COMPUTER EQUIPMENT	1- 2	1 5/8	- 1/8	-7.1
O	COMPUTER MACHINERY	1- 2	1 1/2	- 1/4	-14.2
O	COMPUTER TRANSCEIVER	1- 2	1 1/8	0	0.0
O	COMTEN	2- 5	3 1/2	0	0.0
N	CONRAC CORP	12- 23	17 3/4	+2 5/8	+17.3

F X C H		1975 RANGE (1)	CLOSE SEP 3 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	5- 16	9 3/4	+ 3/8	+4.0
A	DATA PRODUCTS CORP	2- 6	3 1/2	- 1/8	-3.4
O	DATA TECHNOLOGY	1- 3	1 7/8	+ 1/8	+7.1
O	DATUM INC	1- 2	1 3/8	0	0.0
O	DECISION DATA COMPUT	4- 7	4 7/8	+ 1/8	+2.6
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DIGI-DATA CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 2	1 3/4	0	0.0
O	FAURI-TEK	1- 1	1	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1 1/4	0	0.0
N	HAZELTINE CORP	3- 8	3 3/4	- 1/4	-6.2
N	HARRIS CORP	18- 28	24	+1	+4.3
A	INCOTERM CORP	3- 12	9 3/4	+ 5/8	+6.8
O	INFOTEX INC	2- 5	2 7/8	0	0.0
O	INFORMATION INTL INC	R- 14	10	-1 3/4	-14.9
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	1/2	- 1/8	-20.0
A	MILGO ELECTRONICS	8- 24	17	+1 3/8	+8.7
N	MOHAWK DATA SCI	1- 5	3 1/4	+ 3/8	+13.0
O	OPTICAL SCANNING	1- 3	3	0	0.0
O	PERIPHERAL CORP	2- 2	1 3/8	- 1/8	-8.3
O	PERTEC CORP	2- 8	4 7/8	+ 1/8	+2.6
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	3/4	0	0.0
O	QUANTEX CORP	2- 6	5 1/8	+ 1/2	+10.8
O	RECOGNITION EQUIP	2- 9	6 3/8	+ 1/4	+4.0
N	SANDERS ASSOCIATES	3- 11	7 3/8	+ 1/2	+7.2
O	SCAN DATA	1- 3	1 7/8	+ 1/8	+7.1
O	STORAGE TECHNOLOGY	6- 17	13 3/8	+1 1/8	+9.1
O	SYCOR INC	5- 15	13 1/2	- 1/4	-1.8
O	T BAR INC	3- 6	5 1/2	+ 1/8	+2.3
O	TALLY CORP.	1- 5	3 1/4	+ 1/8	+4.0
O	TEC INC	1- 4	2 3/4	- 1/4	-8.3
N	TEKTRONIX INC	18- 41	34 3/4	+2 3/4	+8.5
N	TELEX	1- 3	2 1/8	0	0.0
O	WANCO INC	4- 9	6 1/4	+ 3/8	+6.3
O	WILTEK INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 1/2	0	0.0
A	BARRY WRIGHT	5- 7	6 1/2	+ 1/4	+4.0
O	CYBERNETICS INC	1- 1	1/2	0	0.0
A	DATA DOCUMENTS	29- 42	33 7/8	- 1/8	-0.3
O	DUPLEX PRODUCTS INC	12- 25	16 5/8	+ 5/8	+3.9
N	FANTS BUS. FORMS	5- 7	5 1/4	+ 1/8	+2.4
O	GRAHAM MAGNETICS	5- 10	8 1/4	0	0.0
O	GRAPHIC CONTROLS	R- 21	12 1/4	+ 3/4	+6.5
N	3M COMPANY	43- 68	54 5/8	+ 7/8	+1.6
O	MOORE CORP LTD	39- 51	44 3/4	+1	+2.2
N	NASHUA CORP	11- 22	12 5/8	+ 3/8	+3.0
O	STANDARD REGISTER	11- 23	16 1/4	+ 1/2	+3.1
O	TAB PRODUCTS CO	4- 8	5 3/4	0	0.0
N	UARCO	17- 24	19 5/8	- 1/8	-0.6
O	VARIFN GRAPHICS CORP	4- 7	4 3/4	0	0.0
A	WABASH MAGNETICS	3- 5	4 1/8	+ 1/8	+3.1
N	WALLACE BUS FORMS	15- 25	17	-1 1/8	-6.2

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NEWSPAPER



This model of the IBM 5100, which includes Basic and APL interpreters, is priced at $19,975.

Portable IBM 5100 Micro Packs in 64K, APL, Basic

By Vie Farmer
Of the CW Staff

ATLANTA – Microprocessing took a large-scale jump into the big time last week when IBM packed up to 64K bytes of main storage, a microprocessor and interpreters for both Basic and APL into a 50-lb table-top computer system.

Let there be no mistake, the IBM 5100 "Portable Computer" has set a new high as a super-sophisticated calculator and even as a terminal. It has a miniature CRT display, 1/4-in. tape cartridge, and optional matrix printer, IBM 2741-type interface and a backup tape cartridge drive.

There is no disk capability, however, and IBM spokesmen clearly were sensitive at the 5100's unveiling about revealing just how much real processing power this microprocessor-based system has.

The firm was also careful to clarify that this unit, unlike most of the offerings from its General Systems Division, is not in the same league as the "Mom and Pop" System/32 and System/3.

The 5100 is a sophisticated "problem-solving" tool for sophisticated professionals in both the business and scientific community . . . no payroll, no accounts receivable and no industrywide applications packages.

Instead, there are three optional Problem Solver Libraries offering "walk-through" problem-solving modules in mathematics, statistics and business. Some of the business tasks, for example, include product profitability analysis, cost/volume profit determinations and cash flow analysis.

The spiffiest aspect of the machine is, however, the use of read-only storage (ROS) to handle system control and supervision as well as to store a VS Basic interpreter in 50K bytes and an APL shared variable interpreter in 108K bytes. The user can get either, or both, incorporated into his unit. Circuit densities of ROS are 48K bits per chip, according to IBM.

Single-Card Miero

A small single-card microprocessor is the basis of the 5100. The unit is a stored-program processor with data flow, register and I/O channel.

The microprocessor provides control of system I/O and general processing, according to IBM.

The small CRT screen can display 1,024 characters in 16 lines of up to 64 charac-

(Continued on Page 3)

Univac Strategist Says

Plan Now for Next Software Generation

By Patrick Ward
Of the CW Staff

NEW YORK – It's time to start planning for the arrival of fourth-generation software, Norman Weizer, Univac's director of software strategic planning, told Info 75 attendees here last week.

The average DP installation has its next two to three years of new applications projects already laid out, and "the last of these applications will be built with much more of the fourth-generation software than presently exists," he said.

"The first round of enhancements made on these applications may be almost completely done with the new generation of software," he added.

Manufacturers realize users have invested too much in present software to completely rewrite it for the new generations of machines, he said. Even so, some users may find at the last minute they will have to undertake massive software conversion efforts unless they take a few precautions in advance, he noted.

For one thing, users should program in the standard, machine-independent languages "which will be easily and effectively carried into the next generation," he said.

Users should phase applications coded in Assembly language out of existence. "Since Assembly level languages are mirrors of the current system architectures, they will not be supportable in native mode in the fourth generation," he said.

Info 75 coverage continues on Page 5.

While emulation will be an obvious possibility, it will also waste the capabilities of the new systems, Weizer said.

Fourth-generation machines will use higher level languages instead of Assembly level interface routines to handle data base, transaction and communications functions, he predicted.

"In addition, the efficiency of the compiler-generated code will be vastly increased so that time-dependent programs will not have to he Assemhly coded," he said.

Also crucial for a smooth transition into the fourth generation is a data dictionary/directory containing "a definition of what the data is and exactly how it is used in every application," Weizer said.

Fourth-generation technology and distributed processing go together, Weizer indicated, and "if you distribute your data base you will have to know what applications will take what data."

Weizer also urged users to "stay away from changes to operating systems" as much as they can.

"Your supplier will undoubtedly at-

(Continued on Page 3)

Comptroller Asks USDA to Halt $100 Million DP Procurement

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – The Comptroller General has recommended cancellation of a planned procurement of DP equipment for the U.S. Department of Agriculture (USDA) because "Agrieulture [has] not developed the detailed plans or made the studies that should have preceded procurement."

The study leading to the report found that in implementing its objective to consolidate DP installations and to integrate its agencies' data systems, the USDA started procuring equipment before developing system plans or making the analytical studies which government policies and regulations require.

"As a result, there are unanswered questions concerning the number and location of sites, the DP equipment configurations, interfaces with communications equipment and the privacy and security considerations," the comptroller's report said.

The proposed system involved equipment estimated in excess of $100 million, and total acquisition and operating expenditures over an eight-year period could ultimately cost some $398 million, the report said.

In December 1970, a USDA staff study concluded USDA's DP resources were not being used effectively. The study identified 43 USDA computer systems in 26

(Continued on Page 2)

Secret Service Files Prove 'Squeaky Clean'

By a CW Staff Writer

WASHINGTON, D.C. – Although the U.S. Secret Service maintains a computerized file on about 50,000 people considered potentially dangerous to the President, Lynette (Squeaky) Fromme wasn't in it.

Fromme, arrested two weeks ago for an alleged assassination attempt against President Ford, was never under Secret Service surveillance, according to a White House spokesman. Secret Service spokesmen, however, refused to confirm this.

Fromme is a follower of Charles Manson, who was convicted for the murder of actress Sharon Tate and six other persons in August 1969.

Although Fromme is reputed to have an arrest record "as long as her arm," it was not clear what the dispositions were on some of the arrests, according to California Attorney General Evelle Younger, who said he "plans to find out.

"She has been a problem for law enforcement for a long time," he said. "I just hope she doesn't turn out to be on prohation."

Secret Service officials have told Congress, in open committee hearings, about the existence of the computerized file on persons helieved to be dangerous to the President.

The names are divided into two groups, officials said. The first includes a few hundred persons considered to be serious threats.

Whenever the President is planning to visit a locale where a person on this list resides, local police are contacted to check on the person's activities.

Secret Service officials would not give reporters the criteria they use to decide whether to include a name on the second and longer list or say how that file is used.

It was reported that Fromme had made threats against President Ford as recently as July in interviews with the *Sacramento Bee* and United Press International's Los Angeles bureau.

The threats were deseribed as "vague" and linked President Ford to former President Riehard Nixon, who Fromme blamed for Charles Manson's incarceration.

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Compcon Keynoter Asks Input

Goldwater Calls on DPers for Privacy Aid

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – Rep. Barry Goldwater Jr. (R-Calif.) has called on the computer science community to assist in the implementation of the Privacy Act of 1974 and future privacy legislation.

Congress "needs your input. We can make policy and laws, but you can make the mechanisms to implement them," he said in the keynote address at the 11th IEEE Computer Society conference (Compcon) here last week.

"I ask you to volunteer to take it upon yourself to be committed to privacy and the concepts of privacy," Goldwater said.

"Your familiarity with the technical sides of the question are going to be called on to solve needs expressed by the Privacy Act of 1974," he declared.

The issue of personal privacy is a policy as well as technical matter, he said, adding, "I hope the Privacy Commission can call on computer scientists for technical input so laws will be reasonable" and recognize the economic and social effects, he said.

"Let's insert privacy rights into the programs of programmers," he said. "We must defang Big Brother."

A cosponsor of the Privacy Act of 1974 that affects the use of federal data files, Goldwater said he applauded those technical people who have stepped back from computers to try to assess the impact of computers on society.

"We must stop and look again and see if all the new apparatus and methods are making us slaves to new masters," he said.

"The threat is we're becoming slaves to technocracy."

Goldwater said he thinks American society started to lose direction in valuing the concept of privacy when it began placing too much importance on material possessions and the role of government.

The reliance on hardware helped Americans lose the sense of the true meaning of personal privacy, Goldwater said.

"Now many wonder after we asked the government to do it for us," he added.

Comptroller Wants USDA to Cancel Procurement

(Continued from Page 1)

cities and 67 new computers planned for installation by 1975.

Recommendations resulting from that study suggested that management of all USDA DP resources be conducted by a central office, that an overall DP plan be developed and that large-scale regional computer centers with maximum use of terminals for remote use of the computers be implemented.

Areas of Concern

Following in the footsteps of several task forces, the consulting firm of American Management Systems, Inc. (AMS) was contracted in January 1974 to evaluate the organization and management of DP functions, existing DP operations in the light of user requirements and plans for consolidating DP resources, including communications requirements.

In May, AMS issued its final report, listing several areas of concern. These included the adequacy of USDA's planning and resources for conversion to the new equipment and the accuracy of USDA's costing and sizing estimates.

AMS also expressed concern over the agency's procurement of too much computer power, its lack of specific computer center plans, its lack of detailed data on agency DP workloads and the capability of the Office of Automated Data Systems (ADS) to support the procurement from the viewpoint of organizational structure, technical expertise, planning and staffing.

But after the AMS report, the "USDA did not develop the detailed plans or make the studies that should have preceded the procurement actions," the Comptroller's report stated.

"The central office for the USDA-wide information system did not gather the information about management information requirements and agencies' computing and data communication needs," it said.

The DP requirements used to justify the request for proposals (RFP) released to industry in February 1974 were not representative of total USDA needs, the report added, because they were developed primarily from the workload analysis prepared by only one USDA agency – the Agricultural Stabilization and Conservation Service, one of the largest of the 29 user groups at USDA.

Made No Plans

While the Federal Property Management Regulations states that, under prescribed circumstances, a data communications study should be made before a decision on the need for or types of DP equipment is reached, and the USDA's proposed system fulfilled this requirement, the USDA planned "to first acquire the large-scale DP equipment and then – sometime in the future – gather user requirements, design a network and integrate it with the DP equipment," the Comptroller's report said.

"Apparently USDA has not recognized that efficient and economical acquisition and use of a DP network is directly dependent on how the communications system is tailored to meet agency needs," it further stated.

The Comptroller also found USDA had not adequately considered the security requirements necessary to reasonably protect personal or other sensitive information from unauthorized access.

The RFP provided for user and file passwords, privileged instructions, hardware memory read/write protection and audit trails, but was not based on information on the most likely sources of threat to the data, safeguards available or the most cost-effective mix of security safeguards which would satisfy user needs, the Comptroller's report said.

After completion of the study, the Comptroller recommended that GSA cancel the planned procurement.

He further advised the Secretary of Agriculture to prepare a consolidation and integration plan for the proposed system and to complete the studies of USDA DP and communications requirements, network and configuration analysis, security and privacy requirements and economic factors.

"After completion and comparative analysis of the plan and studies, select, if warranted, the best alternative and prepare a new RFP based on established requirements," the report recommended.

Correction

The 38th Annual Meeting of the American Society for Information Sciences [CW, Sept. 10] will be held Oct. 26-30 in Boston. For information contact Ruth Tighe, Nelinet, 40 Grove St., Wellesley, Mass. 02181.

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Portable IBM 5100 Micro Takes Maxi Leap With 64K

(Continued from Page 1)

ters. But because the screen is so small, IBM has added a switch to expand either the right- or left-hand side (32 characters) of the display across the full width of the screen.

IBM also thoughtfully added a TV monitor adapter so the user can attach a couple of larger CRTs for group display or for those users who want a larger display area.

IBM had 3M modify its 1/4-in. tape cartridge to provide the unit's mass storage medium.

The optional IBM 5103 printer operates bidirectionally at 80 char./sec over 132 char./line.

The keyboard is set up with dual function keys for both APL and Basic when both are ordered together. There is also a calculator pad with 10 numeric, one decimal and four arithmetic function keys.

The tape cartridge operates at 40 in./sec in read, write, search and rewind speeds. This yields an effective read rate of 2,850 char./sec and a write with checking rate of 950 char./sec, the firm added.

In the communications mode, the 5100 appears the same as an IBM 2741 terminal, IBM said.

There are 12 models of the 5100 – four with Basic only, four with APL only and four with both APL and Basic.

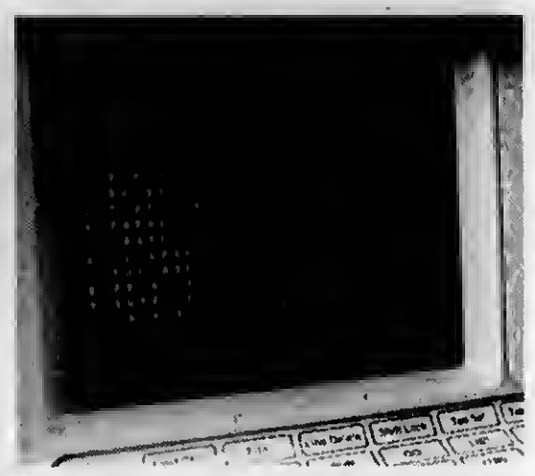
Each series is available with 16K, 32K, 48K and 64K of main memory. A Basic-only 16K is priced at $8,975; an APL/Basic 64K with communications is priced at $19,975.

The Problem Solver Libraries are priced at $500 each on a "one-time monthly charge." This means, according to an IBM spokesman, there is no way a user can actually purchase the libraries and they "remain the property of IBM" under a lease arrangement.

The IBM 5103 printer sells for $3,675 and the 5106 auxiliary tape unit costs $2,300.



Error codes are explained on a plastic tongue that slips into the 5100.



At the 32-character-wide setting, the left or right half of the display is spaced out for easier reading.

Plan Now for Fourth Generation, Software Strategist Urges Info

(Continued from Page 1)

tempt to make as few changes to the user interfaces as possible," he said.

"However, it will be open season on the innards of these systems . . . If you have a code which is intimately involved with these innards, you can be sure you will have to change this code for the fourth generation," he remarked.

One thing the user can do, Weizer said, is decide now which applications will remain essentially unchanged in the fourth-generation environment and which will probably have to be partly or completely redone.

Those applications that will have to be reworked can be either optimized for the user's present equipment or left as is if the user decides their remaining life span does not justify enhancing them.

Decisions on Vendors

Once the user has listed the applications he wants to see carried over onto fourth-generation gear, he must decide whether he wants to stay with his present major software suppliers, Weizer said.

If the user plans to stay with the same mainframe manufacturer, "it becomes very important to follow his lead," Weiser advised.

"All of the major mainframe manufacturers are showing their primary direction for fourth-generation software by their pattern of software announcements and enhancements," he noted.

"It is this 'primary direction' software which will be able to get the most out of the next generation of hardware," he said.

"Remain current on your operating system or start plans now for conversion to an operating system that will be supported in the fourth generation," Weizer urged attendees.

"You should never get more than one or two releases behind the manufacturers' current operating system release level. Many of the changes being put into current operating systems are in preparation for the conversion to the fourth generation," he said.

"If you remain current, you may have several minor conversion efforts which will be more of an annoyance rather than a problem. However, if you remain static for three or four years, you may find the conversion to the new generation will be very painful."

Users who don't want to stay with their present software vendor should try not to get themselves too locked into the vendor's software, Weizer added.

They should also "stay away from unique, extensive modifications to the operating system" and should not get tied into unique Cobol or Fortran features that only their current manufacturer's equipment supports.

For these users, the purchase of outside software packages which run on several manufacturers' equipment might prove to be economic in the long run, even if slightly more expensive in the short run, he noted.

Weizer offered some indications on what form he felt fourth-generation computer systems would take.

Sysgen will probably vanish, and "current operating system functions may be spread across several hardware boxes," he said.

Users will be able to spread their processing load among several systems "as terminals and remote systems become more intelligent and as users and management demand more convenience and reliability," he forecast.

Cobol will remain the primary language for the next generation and, in fact, "the entire internal architectures of processors (hardware and firmware) are being optimized for high level language use.

"Vastly improved" data base and data communications systems "will offer greater ease of use, more device independence, the ability to distribute and access one or more data bases on several geographically separated systems and greater data security and privacy."

There will also be greater use of independently produced software packages, with more turnkey, full-application packages for smaller systems, he said.

A push toward greater convenience in DP use will emphasize "distribution of processing power and emphasis on on-line processing."

Fourth-generation systems will also aim at reducing the time and resources taken by application development and maintenance, he said.

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Xerox Cuts 300 Jobs, Leaves 'Undertakers'

EL SEGUNDO, Calif. – Although Xerox would not release any numbers last week, insiders estimate about 300 people got pink slips this month.

Most of the cuts were made in the sales operation, but the move will not hamper users' ability to communicate with the firm, a spokesman said.

The company "still has a functioning national sales force, including area managers, sales representatives and analysts," he said.

"Since we're not competing for new accounts, the workload and the selling effort have been substantially reduced," he explained.

Those people who remained will continue to be responsible for the installed user base, any customer add-ons and special programs such as OEM customers and users with special needs, he said.

The employees left after the cuts have dubbed themselves the "Undertaker Crew" – "those left to bury the body," one insider said.

In addition to sales personnel, individuals were also cut in functions such as public relations, product management and advanced development, sources said.

Even Bob Tyhurst, secretary of Exchange, the Xerox users' group, was replaced by his boss, Dennis Taylor, who had the job some years ago, Exchange President Bill McAlpin said.

Production workers were apparently saved from this reduction in force by the large backlog of orders placed by users after the firm's phase-out announcement [CW, July 30].

Sources saw the action as a means of streamlining the firm and making it more salable. On that score, Xerox is continuing "discussions" with a number of firms that "have expressed interest in all or part of the operation," the spokesman said.

Mail Contract Passes Despite Fears of DP

WASHINGTON, D.C. – Members of the National Association of Letter Carriers (Nalc) have ratified a three-year contract with the U.S. Postal Service despite criticism from some members that the contract did not provide "adequate protection for the carriers" in the work standards and productivity area.

Presidents of a number of big city letter carrier locals had opposed ratification because they felt the contract offered too much leeway for the introduction of a computer to set letter carrier routes and direct other productivity-oriented measures.

The vote was 88,000 for the pact and 42,000 against, according to James H. Rademacher, president of Nalc. The contract was "overwhelmingly adopted despite the most serious opposition I have ever seen," he said.

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The Only Show in Town

CW Photo Feature
By Vic Farmer

NEW YORK – It wasn't big . . . it wasn't small . . . some of the sessions were standing-in-the-hall-room only . . . and others had a majority of panelists.

But it was the only show in town – it was Info 75.

On the exhibit floor, Honeywell showed up as a last-minute exhibitor. Terminal and software vendors abounded. And attendance was up over last year.

The total exhibit space was smaller than last year with a funny twist . . . last year's exhibitors with large booths took less space, last year's exhibitors with small booths took more space. And so the show came out just about equal to last year's in size.



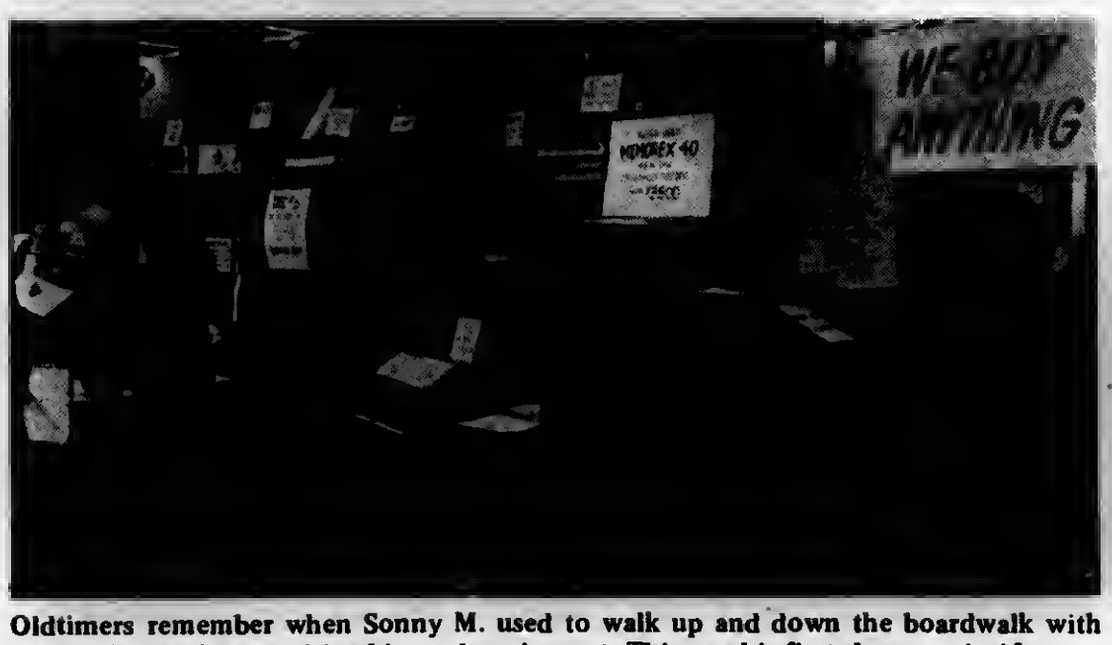
Burroughs demonstrated its 1724, the largest mainframe it has shown anywhere in a long, long time.



It was a double take, as Southern Systems brought in a 360/30 from Time Brokers to demonstrate its new I/O subsystem right next to the small IBM booth.



Keydata celebrated its 10th anniversary.



Oldtimers remember when Sonny M. used to walk up and down the boardwalk with sandwich boards advertising his used equipment. This was his first show . . . inside.



Honeywell decided to exhibit three weeks ago and managed to sell its page printer right off the floor.



Panorama of Part of the Exhibit Floor

Users, DPers Must Set Goals to Realize Cost Savings

By Edith Holmes
Of the CW Staff

NEW YORK – Both users and systems people contribute to the inability of computerized information systems to realize the cost reductions they were installed to achieve, a consultant and a DP center director both told an audience at Info 75 here last week.

Having developed a payroll, personnel and budget system for an unnamed state university, Michael Aherne, vice-president of Integral Systems, Inc. in Flemington, N.J., discussed the school's failure to achieve any savings because the user departments involved never defined explicit goals for doing so.

Joseph Navarro, associate director at the center for Computer and Management Sciences at Rutgers University, then talked in general about the reasons and rationales, opportunities and pitfalls in installing any new system from the viewpoint of systems and other DP personnel.

Ten- to 16-hour days, six to seven days a week, constituted "excessive overtime" for employees in payroll and personnel at the university, creating a morale problem as well, according to Aherne. "One motivation for installing the system was to quiet the discontent of that staff," he said.

Other reasons for the system were also developed: an information system would make compliance with federal requirements easier, and the school was heavily dependent on federal funds; an information system would eliminate overpayments and unnecessary benefits while providing more adequate coverage in benefit areas previously neglected; an information system would improve DP costs and services in all university projects.

CW at Info 75

No Intention to Save Money

But, Aherne noted, at no time were explicit goals developed beyond "shutting up some people and making a name for others. There was no intention to save money, so none was saved."

He added that no user department or individual took the need to reduce costs personally.

"The definition of the systems function was out of control; the system was grandiose, designed to be everything to everybody; and, so, relative to its predecessor, it cost a lot more."

Absolving his own firm from too much of the responsibility for this lack of system development objectives, Aherne said he arrived on the scene after the basic plan had been conceived and a six-month schedule of deadlines established for a project that deserved a development and implementation time of 18 months to two years. After talking with people in eight different user areas, the consultant said he discovered much of that time would have to be spent unloading the cart full of dreams for improvements the system would bring.

In retrospect, Aherne advised his audience never to be without explicit cost reduction goals and justifications and never to fail to meet the cost objectives set. Make sure the operating savings will account for the development costs in a reasonable amount of time, he added.

Finally, he cautioned of the need for "knowledgeable support" from at least some of the users involved.

From their point of view, Navarro said data processing people tend to offer users reasons for going with a new system that are often more pie-in-the-sky than real.

Arguments range from the system will require fewer maintenance and enhancing manhours and will lower cost per transaction so people can be replaced by the machine, and costs will be further lowered by limiting the supplies, services and support needed, he noted.

While such goals are admirable, Navarro added that the "DP promises-to-performance ratio traditionally has not been very good." DPers need to be more realistic, he said.

User requirements are constantly evolving, for example. They will soon expand to fill the new system's capabilities, he cautioned.

"You do not eliminate personnel by bringing a system up," Navarro continued. "The elimination of a coding clerk out of a user shop may often mean the addition of another keypuncher to enter data at the computer center."

Navarro noted as well that the redundancy of output a user thinks he wants is not often what he needs. If considered, these factors could mean real savings in the areas of supplies, services and support, he said.

No matter how well user needs are understood, there are bound to be errors come design time, Navarro told the audience. DP people are the ones who must maintain standards.

But Navarro cautioned DPers must come up with realistic plans that will meet their needs, too. He suggested that, by being realistic from the outset, systems people will lessen the tendency to think of the project "as their child," above and beyond criticism.

Beware of Communications Pitfalls

By a CW Staff Writer

NEW YORK – A geographically distributed operation and faster moving data are important benefits of telecommunications.

But such systems often consist of separate modem, carrier, computer and software companies which engage in multiple finger-pointing sessions whenever anything goes wrong, a consultant warned an Info 75 meeting here last week.

The reliability and efficiency of a telecommunications system requires either a low number of vendors or a tight managerial control, based on a high degree of technical expertise, according to Derwood G. Plyler, vice-president of The Computer Management Methods Co.

At this stage of telecommunications technology, "users should consider service to their operation, rather than efficiency, the overriding concern in how the system is developed and implemented," he added.

Users do have a right to expect benefits from a well-conceived telecommunications system, he continued. Among those benefits are on-line programming which can reduce development time, the ability of the developing staff to "move" to the location needing assistance and computer-controlled programming standards which can result in more efficient code.

Yet Plyler went on to detail the potential pitfalls of a telecommunications system. A user may put together a complicated hardware and software mix only to discover, in a few months, it no longer serves his needs.

For this reason, the consultant stressed the importance of conceiving and maintaining a "future plan" and measuring the performance of the system on a continual basis.

"Telecommunications tends to involve extreme costs," he said, adding users need to look for the hidden and unnecessary expenses.

He suggested, for example, while a hundred copies of a report might be nice, one is sufficient; while terminals may "look good," microfiche may be the best long-term solution to data storage; while "our office does it different," the company has a standard procedure; and while "a secretary ought to be able to run that thing," terminal operation often requires some operator training.

Users may encounter additional difficulties, Plyler warned. Data in transit may pass through more than one carrier; the array and costs of services for moving data over lines constantly change; and the lowest bid equipment might not have sufficient maintenance support.

Once a telecommunications system has been developed, Plyler suggested the user make sure break-even points are in keeping with development costs and all sites are coordinated to ensure projected network cost benefits.

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Depends on Business' Complexity

Plan Matters More Than Time Frame in Five-Year Plan

NEW YORK – The number "five" in the phrase, "the five-yeer plan," is strictly an arbitrary figure.

The important word is "plan," R.C. Bartlett, corporate maneger of information systems plans and controls for IBM Corp., told an Info 75 session here last week.

While the informetion system (IS) plan is a very important and necessary adjunct to effective IS, it is only one element of severel which are required to ensure effective IS, Bartlett said.

"Also, it must be understood that the time frame covered by eny plan is a variable of the business being planned," he said.

As IS activities expand and become more complex, they represent an increasing investment and importance to a business and, therefore, receive greater focus. This focus will result in policies and guidelines which form the framework for the IS management system, he said.

The elements of an IS management system include policies, instructions and guidelines; equipment justification; project control and accounting; and operational audits, Bartlett said. A phase review and audit of the key project is also necessary, as is performance monitoring and measurement.

"If, as I believe, each of these elements is an integral part of the management system and if a system, like a chain, is only as strong as its weakest link, then each part must be adequate to the need," Bartlett said.

Two Plan Cycles

The implementation of an IS management system can be expected to require at least two plan cycles before yielding a viable plan, he said.

The first step is to get management to establish its responsibility for the system and to ensure its support.

"The second step is the planning and assessment process," Bartlett said. "When this is underway, you will be better qualified to address the remaining elements," namely, key project identification, phase review and audit; operational audits; and productivity and value analyses.

CW at Info 75

An IS plan is a subset of the corporation's business plan which is itself divided into the "near in" operating plen which covers the next one or two years and the longer range strategic plan dealing with statements of goals and objectives, he continued.

What is the rationale for an IS plan? There are several reasons, Bartlett suggested, starting with the increasing dependency of organizations on information systems due to increasing business complexity. IBM, for instance, can no longer design or manufacture computers without the use of computers, he noted.

The impact of information systems on business decisions, product and technology dynamics and productivity improvement are further arguments for the implementation of an IS plan, he said.

The degree of formality reflected in an IS plan is a factor of the size of the organization, Bartlett said, but its purpose remains the same: to provide a uniform vehicle for stating plans to support the achievement of company objectives, to assure integration with the rest of the business' needs and to provide a base line for measurement.

"It is also e great vehicle for securing assessment and concurrence," he noted.

Key Projects Use IS

In IS plans, project-orientcd information is usually limited to "key projects" which can be identified in terms of various characteristics such as size ($1 million or more at IBM), time (at least two years), complexity, number of locations involved and stete of the ert, Bartlett said.

"This essentially sets priorities for management focus, covers a few projects and a majority of the development resource and still leaves adequate discretionary resource for line management in the day-to-day operation of the business," he said.

An IS plan should not be done in a vacuum, rether, to perform its purpose of supporting business and management, the IS organization must lock in with the business plan and know whet it will be doing in the future, Bartlett said.

"A final point is that new information systems arc not redos, but are usually greatly expanded in terms of user function and availability," Bartlett concluded.

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Army Satisfied No Citizen Files Transferred to MIT

By a CW Staff Writer

WASHINGTON, D.C. – After investigating "all possible leads," the U.S. Army's Investigative Service found no proof that dossiers on Americans involved in civil disturbances were ever transferred by computer network to the Massachusetts Institute of Technology (MIT) as was charged in the news media last June.

D.O. Cooke, the Department of Defense (DOD) assistant secretary for administration, made this statement during a recent appearance before a combined Senate committee studying technology and surveillance.

"We are at a loss to imagine why anyone would try to hide outdated data on civil disturbances over five years old in the [Advanced Research Projects Agency's (Arpa)] unclassified computer network widely available to subscribers in the academic community," Cooke said.

"If we discover any truth to these allegations, the Department of Defense will be the first to announce it and take appropriate corrective action," he said.

Cooke also took the opportunity to "end confusion" over the functions of three "allegedly" secret, interlocking systems and thus end further speculation about these systems.

According to Cooke, the most highly classified of the three is a network known as the Community On-Line Intelligence System (Coins).

Coins is a "secure system, connecting selected data banks of three intelligence agencies, including the Defense Intelligence Agency, the National Security Agency and the National Photo Interpretation Center."

The network is designed to permit the exchange of classified and highly sensitive foreign intelligence data among those agencies, the Central Intelligence Agency (CIA) and the Department of State, he said.

Upgrading Efficiency

Coins is designed for and used exclusively to share foreign intelligence data on such things as order of battle information and movements of foreign military units. Coins is presently being upgraded for purposes of efficiency, using the interface message processor (IMP) developed by Arpa. However, it is not and will not connect with the Arpa net itself, he said.

Coins contains no information on U.S. civilians and has never been used for Army civil disturbance information, he testified.

The Arpa network, Cooke explained, is an "unclassified computer network, now six years old, developed to enable many makes and models of computer mainframes and their terminals to communicate with one another.

With 86 mainframes in 56 locations throughout the country, the network is widely used by members of the scientific and technological community.

Factual Error

NBC News made a significant factual error in a recent story about the so-called IMP when it said the IMP could "translate" the language of one computer to that of another, Cooke said.

"If it could do that, the computer community would be delighted, and its inventory would be very wealthy," he said.

In fact, the IMP is not a translator, but rather a switch that routes packets of information through communications lines "like railroad switches route trains through the rail network," he said.

As a result of the NBC broadcasts, many people now think IMP can translate computer languages or even spy.

Switching enables subscribers to gain access to the "best" and "most available" computer in the network to study weather, speech processing, seismic data and many computer science developments.

Computerized Index

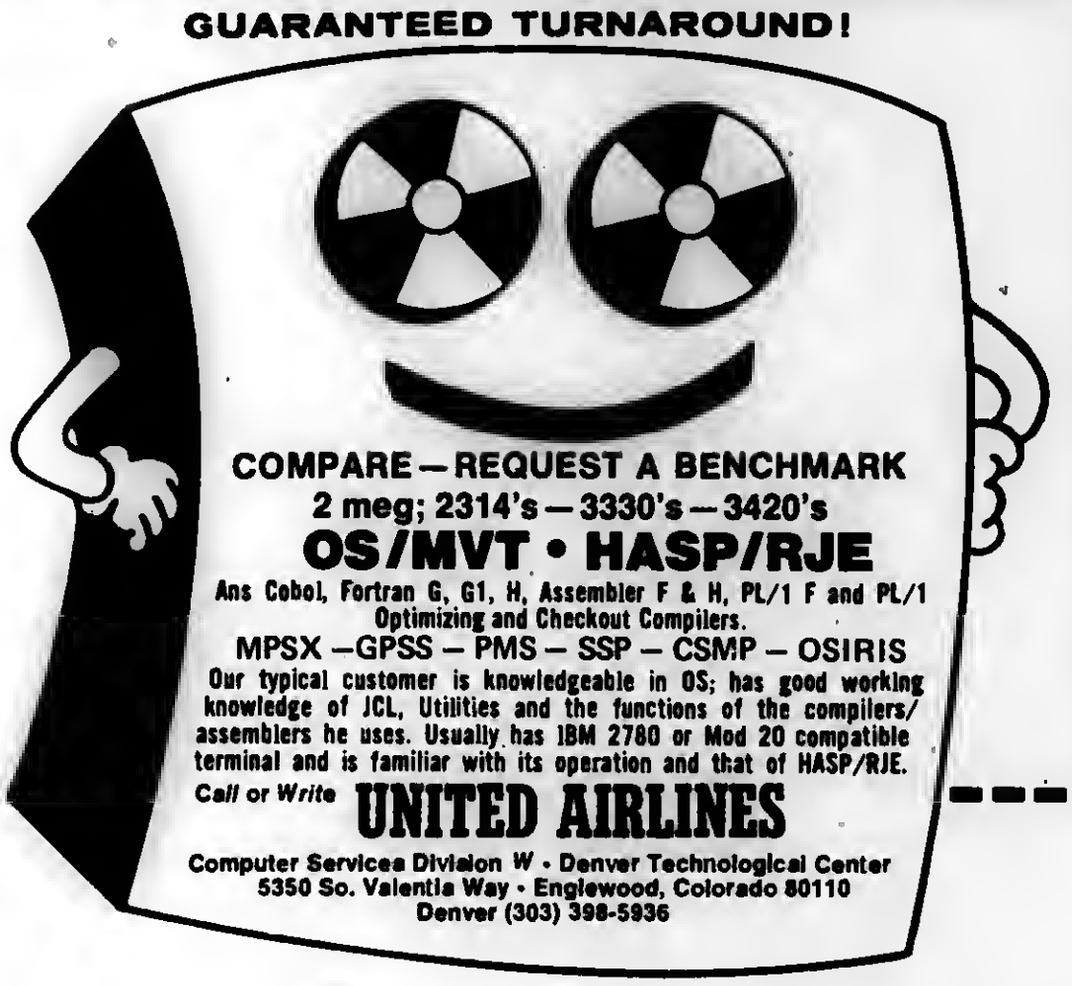
Cooke also mentioned the Defense Central Index of Investigations, a computerized index to investigative files maintained on all persons who are now or were previously affiliated with DOD, including military and civilian personnel and civilian contractors who required DOD security clearance to work on classified government contracts.

Remote terminals in six organizations may access the index, which contains name, date and place of birth, file number and file location.

Only law enforcement or government personnel security investigative units have access to the data in the index or the files located by the index, Cooke said.

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USSR Theory Equals That of U.S., But Hardware Seen Less Advanced

By Toni Wiseman
Of the CW Staff

NEW YORK – Computer theory in Russia may be as advanced as here, even if the USSR is less technically advanced in the hardware area, according to a recent visitor.

"The Russians are at a first- or second-generation level in hardware, but their mathematical people and theoreticians could hold their own with anyone in this country," said Paul A. Lotto, director of systems and computer services for the Metropolitan Transportation Authority here.

Lotto recently traveled to the Soviet Union as a member of an advisory committee in the first step of a joint Soviet/U.S. program to study the application of computers to the management of large cities, specifically in the areas of municipal management, urban transportation and urban goods transportation.

The purpose of the government-funded project is to determine what would be mutually beneficial areas for research.

A Soviet delegation will make a two-week visit to the U.S. later this year.

Current computer applications in the Soviet Union were for the most part very modest and stand-alone operations, Lotto said.

"Inventory management and construction project management were very primitive, accounting systems at best," he said. "Their payroll and personnel systems, however, were very complex and impressive because of the elaborate profit-sharing schemes they have."

"In terms of the state of the art, they are five to ten years behind us. They know little or nothing about simulation, and this is an area where we can provide some expertise," Lotto stated.

Much to Learn

"But in terms of automatic train control, we have much to learn from them," he emphasized. "The Moscow metro is a prime example of what our Bay Area Rapid Transit (Bart) system is not. They are much more advanced in terms of automatic fare collection, automated control of energy consumption and automated pollution control."

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Finger Pointing Also a Factor

Complexity Faulted in Criminal Data System Problems

By Catherine Arnst
Of the CW Staff

BUFFALO, N.Y. – Breakdowns in a criminal justice information system here have been attributed to a lack of cooperation among the vendors involved and to the complexity of the system.

One reason the system was down 35% of the time during August was the "tremendous amount of time spent" trying to determine whose fault each problem was, said Les Meszaros, director of information for the Erie County Department of Central Police Services (CPS).

The system, which consists of a Univac Spectra 70/45, 40 Uniscope 100 terminals, Burroughs modems and the telephone company's lines, went on-line Jan. 1 and had no problems 90% to 97% of the time until June, according to Meszaros.

"Ideally, it should have been just a two-vendor relationship," Meszaros said, "with terminals, modems and lines all provided by the phone company. The three vendors are a result of competitive bidding. As a result, the user suffers."

The system is operated by CPS and used by the 29 police departments in the county. Besides containing local arrest and crime information, it links into the New York State Police Department System, the National Crime Information Center, the New York State Department of Motor Vehicles, the New York State Justice Department and the National Law Enforcement Teletype Network.

An inquiry can be made to all five networks at once, with an approximate response time of 10 seconds. It is the only system in the state that receives criminal histories from a statewide repository – within 2-1/2 hours a user can receive on his terminal a 60-page rap sheet.

Variety of Factors

Breakdowns can be attributed to a wide variety of factors: failure on any of the five networks into which the system links, maintenance problems and weather conditions. Lightning has knocked down lines several times, Meszaros said.

In addition, the system has no dual processor, although Meszaros said he has repeatedly requested one. At present, the only backup the system has are hard-copy files, although CPS has placed a request for microfilm in its next budget.

Problems are to expected, Meszaros said, "because the system is very complex; more complex than we expected." He considers a 5% downtime rate reasonable.

Downtime started increasing in June when the center's air conditioning wasn't working properly. This went on for an extended period of time. "We countlessly asked the county to correct the problems," Meszaros said. However, he is still not sure whether the room temperature caused the system's problems.

Software Problems Surface

By August, some major software problems surfaced, including a unique disk error which caused a variety of malfunctions such as accessing wrong tracks and losing data. This is when CPS found a lack of cooperation among the vendors, according to Meszaros.

"More expertise from the vendors should have been made available," he said. Each one kept coming in, checking out the system and claiming it wasn't his equipment causing the problem."

It took about 2-1/2 weeks to diagnose the problems, and Meszaros said the 3,000 police officers using the system were very understanding. Local departments were usually notified when the system was about to go down, and operating manuals included instructions and phone numbers in case the system crashed with no warning.

Although parts of the system were down about 35% of the time, the entire network was inoperative only 15% of that time, Meszaros said.

Favorable Reaction

Generally, the system has received favorable reactions from the police, county officials and the public, Meszaros said.

"It is unique in the country because it has communications with all the state and nationwide computer systems," he said. "It is also the only one that is a dedicated criminal justice system – we don't do any other applications on it."

CPS has received federal funds to enhance the system and, in the next two years, it will be expanded to merge the rest of the criminal justice centers such as courts, holding centers and prisons.

Previously, the county had a limited Teletype network which provided communication between local departments and the Sherriff's office and was used mainly for administrative communications. CPS was established to provide "technical services for local police departments who couldn't afford them otherwise," Meszaros said.

"Our philosophy is to build a system to provide the police officer with rapid communications and access to information that will help him do his job better and more safely."

Meszaros did not know what effect the system has had on the county's crime rate; although FBI figures show crime went up in the county, he said this is due to the more efficient reporting system now used in which all crimes are reported accurately and uniformly.

Underwater DP-Based Device Helps Divers Avoid Getting the Bends

KAILUA, Hawaii – A microcomputer about three times the size of a wristwatch has been developed to help scuba divers avoid getting the bends.

A painful and occasionally fatal condition, the bends occur when gas bubbles form in the blood of divers who surface too quickly after a deep or prolonged dive.

No particular water depth is responsible for causing the bends, according to Kirk Jennings, developer of the underwater device and an electronic engineer at the Naval Undersea Center here.

The condition results as a function of water depth, time spent under water and time taken to come to the surface, Jennings said. "A computer is needed because the combination of these elements is not a straightforward problem."

The microcomputer has an Intel Corp. 8080 microprocessor chip which Jennings has programmed with data from Navy dive tables.

Equipped with a depth sensor which measures the ambient water pressure at any given depth and inputs that information to the computer, the device calculates a safe ascent rate. It includes a battery power source enabling the diver to remain in the water up to eight hours, Jennings said.

The device will be tested by the Navy and may be manufactured by private industry.

Study Reports Automation Efforts In Oriental, South Pacific Libraries

TEMPE, Ariz. – The Association for Library Automation Research Communications (Larc) has published a report on Larc delegates' meetings with their counterparts in Japan, Southeast Asia, Australia and New Zealand last year.

Entitled "Library Automation: The Orient and South Pacific," the 96-page report contains 20 articles, an introduction by Jack D. Key and a special article on information networks.

Representative articles include "Computer Applications in Libraries of Japan," "The Processing System of Japanese Bibliographic Data of the National Diet Library," "Mechanization of Lihrary Procedures at the Kyoto Sangyo University" and "Computer-Based Cataloging System at the New South Wales Institute of Technology."

Other articles discuss additional university applications in each of the five countries visited, reports of specific applications within library installations and a study of potential application of automation in Southeast Asia.

Larc can be reached through P.O. Box 27235, 85282.

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DP-Generated Atlas Shows

Breast Cancer Mortality High in Northern Urban Areas

By Toni Wiseman
Of the CW Staff

BETHESDA, Md. – Mortality from breast cancer is high in northern urban areas, particularly the Northeast, while rates are generally low in the South, according to a computer-generated, county-by-county atlas published by the National Cancer Institute.

Scattered high rates of leukemia are prevalent in the central part of the U.S. from Texas to Minnesota for both males and females, while high mortality rates from thyroid cancer in both sexes are seen in the Rocky Mountain and North Carolina states, according to maps in the atlas.

The atlas was based on a compilation of more than five million cancer deaths between 1950 and 1969 in all 3,056 counties of the 48 contiguous states.

The atlas may help in pinpointing high-risk communities where detailed studies may detect special cancer hazards that have gone unrecognized until now, according to Dr. Joseph F. Fraumeni Jr., associate chief of the epidemiology branch of the National Cancer Institute.

The input data for the computer consisted of all death certificates from the 48 contiguous states that listed cancer as the cause of death.

Automated Cartography

The maps were produced by an automated cartography system developed by the center for the IBM 360 and 370 systems at the National Institute of Health (NIH). This system, Fraumeni noted, interfaced with an integrated graphics software package available for use with computer output microfilm equipment at NIH.

"We prepared computer-generated maps for 35 cancer sites (bone, stomach, breast, etc.) and discovered a surprising number and variety of 'clusters' or 'hot spots,'" Fraumeni said.

For example, in males, clusters of excessive mortality from cancer of the bladder occurred in New Jersey, New York City and urban areas around the Great Lakes. Rates were also elevated in rural New York end New England and the Mississippi River delta in Louisiana.

Mortality rates for females, however, were not high in New Jersey, but did increase in rural New England.

The meps also pinpointed the fact that stomach cancer deaths are significently higher than the national average in scattered arcas of the northern Middle West and some parts of the Southwest.

On the other hand, the maps showed no unusual cancer death patterns among residents of communities where drinking water was contaminated by asbestos fibers or where homes were built on radioective tailings from uranium mines, Fraumeni said.

But "the maps of cancer mortelity, together with the correletion studies conducted to date, suggest that environmental factors, including industrial chemicals, account for at least part of excess cancer risk in certain communities," he added.

Passage of Abortion Law Credited to Mini Data

By a CW Staff Writer

URBANA, Ill. – Barbados was able to get an abortion law passed thanks to information on future population and food supplies provided by a computer.

Paul Handler, research professor of physics at the University of Illinois here, has developed a program which forecasts the consequences of population trends for the U.S. and 125 other countries.

In thc casc of Barbados, Handler was able to grephically show officials what the population growth for their country would bc. In addition, he left them a hard-copy printout of thc findings gcncratcd by his program for study and presentation to support the passagc of thc abortion law.

The program, which is sponsored by the Agency for International Dcvelopment (AID) and thc National Science Foundation, can show the historical growth of the population as wcll as futurc growth for a country. It can also chart past and future food and cnergy supplies.

Thc project uses the Plato computer-based tcaching system and is installed on a 32K Data General minicomputer equipped with a plasma display screen.

The algorithms, written by Handler, work on data supplied primarily by the U.S. Department of Agriculture. The United Nations and the World Bank also supply information for projections.

'Mode of Communication'

"The information is being used for planning and for training people ranging from social workers to ambassadors and ministers in population awareness, motivation and policy," Handler said.

"But essentially, we are using the display as a mode of communication to decision makers, based on the philosophy that by the correct presentation of graphic information we can make people with no previous background in thc field understand thc implications of rapid population growth on the social and economic welfare of a country," he added.

Under a five-year AID contrect, some 10,000 people have been trained at centers in the State Department, Office of Population, University of North Carolina, University of Pittsburgh and University of Colorado at Denver.

While the information is primarily being used in the U.S. at present, there are no plans to put in similar 32K minicomputer systems overscas, Handler said, noting requests have come in from over 50 locations, including Latin America and Southeast Asia.

The systems, once installed, will bc fully programmed and updated by members of the project, Handlcr said.

India, for instance, would thus be able to see that in 1980 it will need 31% more food than in 1970 if there is no change in the rate of that country's population growth, he said.

"That's not possible," he noted. "Since 1970, food production hasn't increased at ell there. There would have to be a 6% increase each year from now until 1980."

EFTS Finds Religion As Collection Plate

ATLANTA – An electronic funds transfcr system (EFTS) has found religion.

As part of a two-year pilot program, worshippers of 10 Protestant dcnominations in five U.S. metropolitan areas will be able to automate their contributions to the church of their choice.

The Commission on Stewardship of the National Council of Churches hopes the project will provide a regular flow of funds for the churches, rather than putting them "at the mercy of tardy, forgetful or vacationing contributors."

The Authorized Contribution Transfer Service (Acts) will link together churches, banks, credit cards and computers. A worshipper at an Acts member church can fill out an authorization slip directing a specified amount be deducted from his account and deposited in the church's account.

Or, if he chooses, the contribution may be posted to his Master Charge or BankAmericard account. These donations may be monthly or quarterly.

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Program Tracks Reading Skills in Early School Years

By Toni Wiseman
Of the CW Staff

KANSAS CITY, Kan. – Only three days after the opening of school here this month, a computer is helping to identify and keep track of students' reading skills and problems.

Part of the success of the program is its ability to identify specific reading problems quickly so children can be helped, according to Carl A. Hendon, assistant superintendent of schools for the Turner Unified School District.

Called the Fountain Valley Teachers Support System in Reading, the program measures 288 specific skills considered necessary to become a good reader. These skills are usually acquired in the six years between grades one and six.

Children take tests administered on cassettes to eliminate administrative differences, writing down their answers with pencil and paper. The tests, Hendon said, are unique because they not only ascertain whether a child has acquired a skill or skills, but also diagnose auditory or visual dysfunctions which might impair reading skills.

The system is very versatile, Hendon said. Students may take tests any time they feel they have mastered a skill, or a teacher can administer the test to an entire class.

One keypunch operator keys in student answers. The operator does not have to note whether an answer is correct; the student's answer is simply recorded, Hendon said, adding "the software does the rest."

Running on an IBM 370/145 at the Wyandotte County courthouse, the program generates each day's test results by the following morning.

The system prepares two key reports, the Pupil Profile and the Results Report. The Pupil Profile charts a student's reading progress and lists deficiencies. It reports his age to the month, reading achievements and skills needing work.

The Results Report shows test activity completed by a student in a single day and lists skill deficiencies.

When a teacher or student feels he is ready, the test is given again, Hendon said; if the student is successful, the particular deficiency note is eliminated from the report.

'In Laymen's Terms'

The reports are produced in duplicate, one copy for the teacher and one for the student to take home. Worded in "laymen's terms," the home report was designed to aid parents in helping their children's progress.

A report might say, for example, "Initial consonant sound B needs more work." This precise pinpointing of the problem is a great advance over just knowing a child has trouble with consonants, Hendon said.

"These reports facilitate communication between teacher, child, reading specialist, administrators and parents," he added.

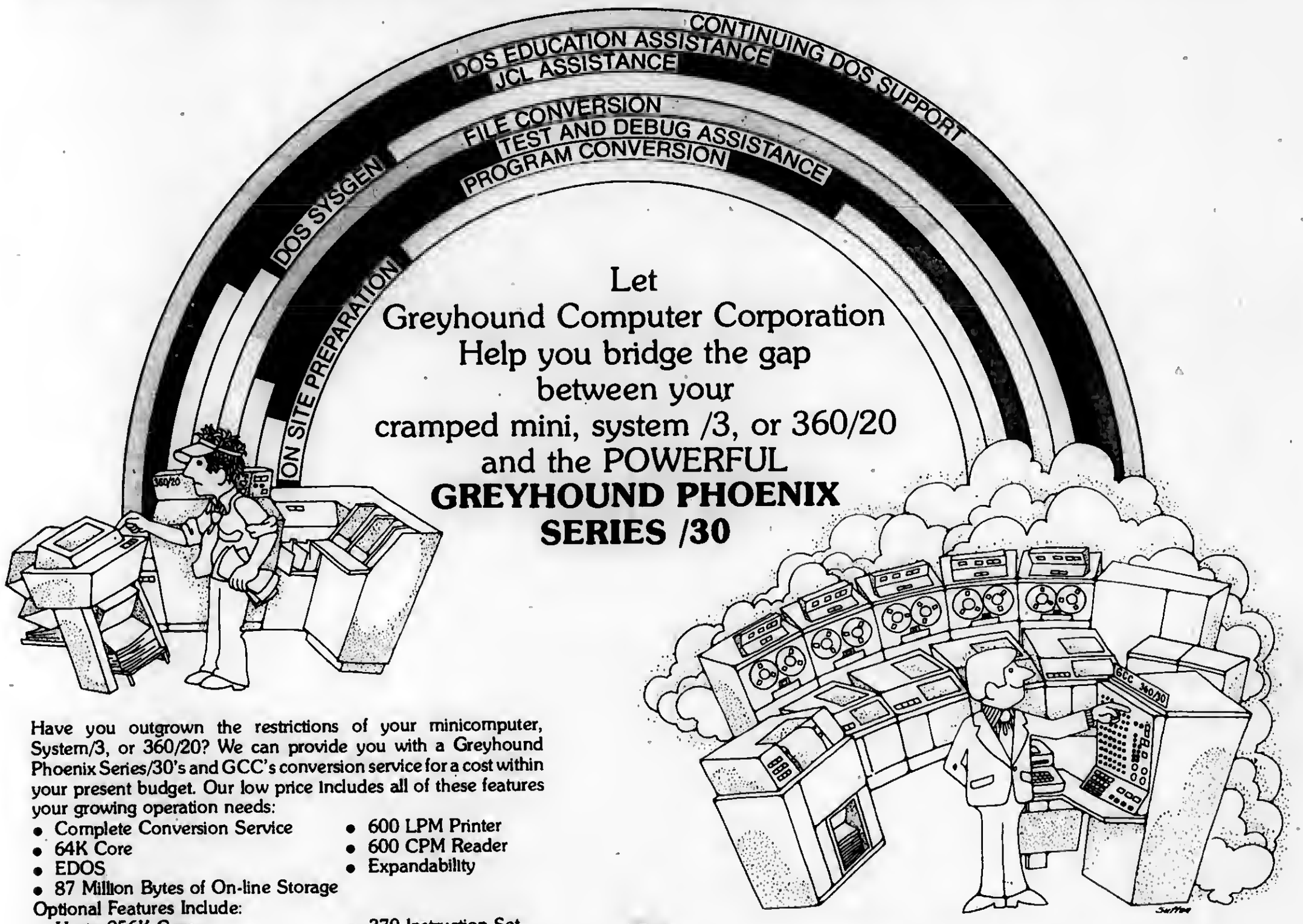
"Teachers know how effectively they are instructing since test results are ready within 24 hours. If they see a problem, they can review it with students while the concept is fresh in the pupils' minds."

Other reports group students into categories by skill deficiencies; by students within a particular class; across all grade levels in one school; and within a particular grade level in one school.

Hendon feels the difference the program has made should be measurable within three years. It will also enable each school to measure the effectiveness of various reading programs.

This year, for instance, three different reading programs are being used in kindergarten classes.

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Editorial

CW Solicits Data Entry Views

By now nearly everyone realizes IBM no longer manufactures keypunches of any kind and refurbishes only returned units. But it is more difficult to say just what *users* want to replace their existing data entry equipment.

This survey is geared to get a cross section of ideas on just what data entry tools typical business users would like to see developed over the next five years. The results of this survey will be published in the Oct. 29 Data Entry Special Report in *Computerworld*.

For your convenience, you can use the postage-paid subscription envelope stapled into this issue. Just cross out "Circulation" and write "Editorial" so your vote and views can be tabulated quickly. Additional comments can be attached directly to this form.

1. What is the best description of your center today?
   ___ Heavily centralized batch data entry
   ___ Centralized batch data entry with less than 50% remote batch
   ___ Centralized batch data entry with less than 50% on-line data entry
   ___ 50% or more remote batch
   ___ 50% or more on-line data entry
   ___ Other ___
2. How many keystations do you presently have installed? ___
3. Which of the following data entry approaches are ahead for your center over the next five years?
   ___ Heavily centralized batch data entry
   ___ Centralized batch data entry with less than 50% remote batch
   ___ Centralized batch data entry with less than 50% on-line data entry
   ___ 50% or more remote batch
   ___ 50% or more on-line data entry
   ___ Other ___
4. Which of the following technologies are you presently using within your installation for data entry?
   ___ Keypunches ___ OCR or other mark readers
   ___ Dedicated application terminals (such as point-of-sale devices)
   ___ Key-to-disk ___ Key-to-diskette
   ___ Key-to-cassette
   ___ Direct on-line entry (general-purpose terminals)
   ___ Other ___
5. Which of the following technologies do you see as taking a greater share of your data entry requirements?
   ___ Keypunches ___ OCR or other mark readers
   ___ Dedicated application terminals (such as point-of-sale devices)
   ___ Key-to-disk ___ Key-to-diskette
   ___ Key-to-cassette
   ___ Direct on-line entry (general-purpose terminals)
   ___ Voice recognition
   ___ Other ___
6. Considering the wide range of data entry equipment presently available, just what would you like to see vendors accentuate and develop over the next five years?
7. What is today's most difficult problem in data entry?

My job function is:
___ Management
___ DP Management
___ Programmer/Analyst
___ Other

Identification (Optional)
Name ___
Title ___
Company ___
Address ___
Can we quote you personally?
Yes ___ No ___



Terminal Output

Letters to the Editor

Replies to Chauvinist Smack Of Lack of Ratiocination

I wish to register my indignation and disappointment at the arguments used by John Morris and Barbara McLean [CW, Sept. 3] in their replies to Thomas Mooshammer's letter [Aug. 20]. The glow of self-righteous fervor which their letters projected should not be allowed to blind the reader to their use of illogical appeals to nationalistic prejudice.

Morris was "reminded" that Mooshammer's countrymen can hardly be expected to grasp ". . . scientific methods in sociological research," handicapped as they are by the burden of a guilt-stained past."

McLean, too, was "reminded" by Mooshammer of "a former spokesman of his country," but she is above mentioning names – let the gentle reader dredge up the name of the architect of the Final Solution to the Jewish Problem from those same dark depths of his memory wherein lie the most awful specters of mortal terror and moral revulsion.

It is this use of innuendo, this evocation of mindless chauvinism that elicits my indignation. My disappointment is in the inability of these members of a profession dependent on ratiocination to present a logically thought-out argument for their point of view.

James Walker

New York

Women Represent Talent

Undoubtedly *Computerworld* has had an incredible response to Thomas Mooshammer's equally incredible letter.

I noticed CW printed two responses from female readers and one from a male reader. I hope this does not indicate that our female counterparts are twice as outraged as we.

I do not know what position Mooshammer holds but, if it is management, let him remember his job is to get the work done as effectively as possible. It makes no difference to the user if the information is manipulated by males or females, just that it is correct.

Talent is neuter, and why Mooshammer would cut himself off from 51% of the talent is beyond me.

Dave Goodman

Mason, Mich.

DPers, CW Must Shape Up

Computerworld has already been lambasted sufficiently for even printing the article on women in DP [CW, July 23]. But I think I have figured out why it was done.

A few weeks ago, I wrote and protested the massive borders around Black Hat/White Hat. As expected, no change. Now I think I know why. And the whys are the same.

Come clean, CW! CW is hard up for reader response – no letters to print, so it has to run sensational, ludicrous articles to generate more than apathy from its subscribers.

Only trouble is, it's a double indictment. And every reader who doesn't sit and write his viewpoint on the issues of DP deserves the face slap such trash as this article on women was.

Now, who's going to shape up first?

Alan P. Schlutsmeyer

Pasadena, Calif.

Where Are the Facts?

Having been responsible for the maintenance of The New York Times Information Bank on and off for the past 3-1/2 years, we would like to comment on both Peter Denning's statements in the article, "Rules Not Helpful All The Time," in the June 4 issue and F.T. Baker's letter to the editor in the Aug. 13 issue.

First of all, Denning is completely unknown to us. Therefore, his opinions regarding the maintainability of the information bank, the number of bugs found therein and the difficulty in completing it are, at best, hearsay.

As for it being a "disaster," we completely disagree and would like to believe that irresponsible statement had to be either a misquote or some feeble attempt at humor at the expense of the system.

As far as Baker is concerned, though we have the greatest respect for his ability and for the product he delivered, his statements regarding the success he enjoyed in both developing and maintaining the bank have always tended to be somewhat self-serving and misleading. His responsibility ended 3-1/2 years ago, and all bugs, functional specification shortcomings and other system deficiencies encountered since then do not appear in his statistics.

In addition, it is not for the developers of a system to judge its maintainability, but rather for those responsible for actually maintaining it.

In conclusion, we at *The Times* find it rather irritating that, all too often, there are people who write articles, give lectures and answer questions on the information bank without any direct knowledge of the subject matter.

Is the system readable, maintainable, bug-free, hard to complete, etc.? Only the people who read it, maintained it, fix bugs, complete it, etc., can comment knowledgeably.

Stanley Kaplan
Harvey Morgenstern
Bob Blumfeld
The New York Times
Information Bank Project

The New York Times
New York

By Paying Stock Dividends

IBM Attempting to Diminish Embarrassing Cash Hoard

By George Warren
Special to Computerworld

It's true, the rich get richer. Giant IBM, which has spent the last several years amassing a huge cash fortune, now has the greatest hoard in its history – over $4 billion.

IBM has greater cash assets (defined as cash in banks and near-cash marketable securities) than most banks. IBM earns more from interest on those assets than most computer manufacturers earn from their hardware business.

As a profitable and growing computer vendor, IBM must be somewhat embarrassed by its declining earnings from operations. After years of ever-increasing profits, IBM's net income from the manufacture and sale of computers was off about 5% for the latest quarter, compared with a year earlier.

As a bank, however, IBM is growing very nicely. For the latest quarter, "other income," which is mostly interest from near-cash investments, was up 20% from last year.

In terms of liquid assets only (that is, excluding such things as factories and computers on rent to customers) IBM would rank within the top 30 banks in the U.S.

IBM's spurt of earned interest is a direct result of its ever-bulging hoard of cash. From a "modest" $1.6 billion at the end of 1969, the cash cache swelled to more than $4 billion at the end of 1974, up by a factor of 2-1/2 in five years.

Cash represents about 30% of IBM's total assets, almost as much as the book value of machines on rent to customers (which is about $4.3 billion).

Interest rates have been high for the last several years, so IBM has enjoyed a compounding of interest earned from those billions. The 1974 year-end financial report showed record high interest income, averaging more than 8% return on investment.

Reader Commentary

Any business requires a certain amount of cash to operate, to sustain its daily business activities. But IBM's cash is so great, it is sufficient to cover all operating expenses – assuming no incoming revenue – for more than five months.

In the five-year interval 1969 through 1974, IBM's gross revenue from operations increased by about 76%. During this same period, the money pot grew three times as fast as gross revenue.

Cash a War Chest?

Indeed, IBM's reasons for accumulating this vast wealth are mysterious. In an earlier analysis ["What Is IBM Going to Do With Its 'Trapped Riches'?", CW, Aug. 8, 1973] I suggested the cash might be a war chest, held aside for the possible payment of huge antitrust judgments.

But Telex, which had asked more than $1 billion in its suit, was awarded only about a quarter of that, and that award was overthrown by the appeals court.

If Telex could not win its antitrust case, it is unlikely that others (Memorex, Sanders, etc.) will be able to prevail against the Armonk giant.

The government's antitrust case seems to be headed for a consent decree, perhaps breaking IBM into small pieces, but probably not imposing a cash fine. So the war chest would seem unnecessary.

Nor can IBM's acquisitions of other businesses have much effect on the mounded cash.

The proposed IBM joint venture with Comsat for a satellite data communications system predictably drew cries of antitrust pain from competitors. The total investment would be modest by IBM's standards, but the resulting impact on others in the data communications business could be severe.

The government also worries about the competitive impact of such deals by any giant in American industry. The Federal Communications Commission is holding up the IBM-Comsat venture until it receives proper assurances that competition will not be stifled.

It would seem that almost any significant IBM acquisition would draw similar scrutiny from government and competition alike.

Apparently, the long-rumored IBM Future Systems (FS) project, involving the development of the next generation of hardware and software, had been either shelved or scaled down. IBM seems to have decided to continue to market the 370 line of equipment for several more years. So the current development costs of the FS project probably have been reduced, lessening the need for development cash.

Profitable though they may be, IBM's cash assets continue to earn at a much lower rate than its factories and sales and service organizations. Despite the recent simultaneous rise of interest income and drop of operating income, IBM receives about 46 cents of gross income from each dollar invested in plant and rental machines, but only about 8 cents from each dollar held in cash or marketable securities. IBM's banking operations, while growing, are relatively poor business compared to its traditional efforts.

To relieve itself of some of its cash, IBM continues to increase dividends paid to stockholders. The current annual dividend rate is about 25% higher than last year. Dividends to shareowners would seem to be the only practical way to reduce the stored riches. Dividend payout in 1974 increased $165 million from 1973. Cash increased by "only" $24 million. The increased dividends prevented further swelling of the cash balances.

Stockholders can probably expect the dividend rate to continue to grow. IBM

(Continued on Page 14)

Darmstadt System Eliminates Check-Digit Loopholes

The Taylor Report
By
Alan Taylor, CDP



The Pennsylvania Bureau of Sales and Use Tax some time ago adopted a Modulo-10 check digit to safeguard a seven-digit number. The technique it selected was to multiply the first digit by 7, the second by 6 and so forth until the last digit was multiplied by 1. It then used the Modulo-10 complement of the answer as the check digit and placed it after the seventh number.

The system worked like this for account number 1234567:

Account Number:	1	2	3	4	5	6	7
Check Digit Multipliers:	7	6	5	4	3	2	1

Check Digit Computation:

1 x 7 = 7
2 x 7 = 12
3 x 5 = 15
4 x 4 = 16
5 x 3 = 15
6 x 2 = 12
7 x 1 = 7

Total = 84
Mod-10 = 4
10 Complement = 6

Therefore, the number assigned as a check digit for 1234567 was 6.

The system was expected to catch single-digit errors in any numbers and also to catch transpositions of numbers. There were, it seemed, six possible transpositions to be considered – those between the first and second, between the second and third and so on.

System Weaknesses

However, in practice, the system has not lived up to expectations. A seventh transposition, previously unnoticed, was found. This was between the seventh and check digits.

Thus, in the case of account number 123456 + 6 developed above, the transposition 1234566 + 7 could occur. Since the last multiplier before the check digit was 1, this, unfortunately, happens to be a valid number complete with its own check digit.

In fact, every time this transposition occurs on this system, a valid number is produced – weakness number one.

A second weakness turned out to be the use of the digit 5 as a multiplier for the third digit position. Multiply 5 times 3; the result ends in 15. So does 5 times 1, 5, 7 and 9. Equally, 5 times 0, 2, 4, 6 and 8 all have 0 as the last digit.

Mistakes in the third digit, then, are caught only where an odd number is mistakenly read as an even one or an even one is read as an odd one. If all numbers are equally populated, this suggests about 50% of the mistakes made on this digit just slip through the check digit system.

Understanding Checks

While these facts are now appreciated, the fact they were not realized before the system was designed suggests it would be as well to understand a little more about the errors that can slip by check-digit systems, as they are quite numerous and can be avoided with a little forethought.

If one makes a table of the digits when multiplied out, arranged in order of possible confusion, one finds only four of the 10 digits provide unique solutions for even the first multiplication. These are 1, 3, 7 and 9.

All the even numbers have only five result digits to spread among the 10 possibilities, because they result in even numbers whether the original digit is even or odd. As for the digit 5, we have already discussed its problems.

As you can see from the figure, this means that in the Pennsylvania case, 17345676 or 12395676 or 12345176 would all be accepted as being good numbers, although single-digit errors have occurred in the second, fourth and sixth digits.

These errors in each case are somewhat more important because of the actual error situation that is missed. In all the even-number multipliers, the numbers that can slip through the nets are the same pairs – a 6 is indistinguishable from a 1, a 7 from a 2, an 8 from a 3, a 9 from a 4 and a 0 from a 5.

For each right answer, only one wrong answer is acceptable but, no matter what the even multiplier, it happens to be the same wrong number.

And, more importantly, it happens to be always the digit five away from the right answer that can slip through. Or, as some old timers in computers may realize, it is the biquinary equivalent.

Unfortunately, it is not only computers that used biquinary scales early in the game of numbers. Biquinary, or two-five numbering, came naturally to us two-handed, five-fingered people. And the very numbers we use in handwriting are, in fact, biquinarily related.

The digit 6, badly written, can come out very like a 1 – 2 can be easily confused with a bad 7, 3 and 8 although related in shape are not easy to confuse, but some people's 4s and other's 9s can be misread. So the type which slips through the system includes some of the easiest errors to make – which makes everything more serious.

Single-Error Vs. Transpositions

While single-error detection suggests that systems should only use weights of 1, 3, 7 and 9 – the four that have the unique solutions – catching transpositions involves keeping the differences between the adjacent multipliers as unique as possible. All the differences between these four digits are even – and so must let some (10% or more) of the single transpositions through also. Which numbers they are will be determined by the weights themselves – but they will exist as loopholes in the system.

To obtain complete coverage of transpositions, the difference between adjacent weights must also be in the 1, 3, 7 and 9 values, which on pure Modulo-10 work is clearly impossible.

Luckily, a solution to this impossibility is available with as small a deviation from the Modulo-10 technique as possible. It occurs in a system which is used by a German book club, Deutsche Buchgemeinschaft or Darmstadt and doubtless other places. The system used for a seven-figure number multiplies and also sums the digits of the first, third, fifth and seventh digits, using 2 as the multiplier.

This effectively maps the results of each of these numbers into all 10 decimal digits and gets away from the prior 1/6, 2/7, 3/8, 4/9 and 5/0 confusion. For example, 1 multiplied by 2 becomes 2 and stays 2 when the digits 0 and 2 are summed. But 6 goes to 12, which when summed becomes 3, and will no longer get confused with 1 as previously was the case for any even multiplier.

Having got out of the difficulty this way, the system uses all ones as multipliers for the even digits. So no trouble there about confusion so far as single-digit error is concerned, as one is one of the four optimal digits available.

Similarly, in transposition problems, all the differences between adjacent weights are again optional – being 1 in all cases. The total multiplier is then simply 2121212.

The Darmstadt system seems to work as far as I can see and, hopefully, can be adapted for other Modulo-10 check digit systems which, like that of Pennsylvania Sales and Use Tax, are not giving the results that had been expected of them.

My thanks are due to Professor Glaser of Pennsylvania State University for the two check-digit examples used. If anyone can suggest some good references on the subject, which is not often written about as far as I can see, it would be appreciated.

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By Paying S

IBM Att

By George W

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The Pennsylvania Bu
Use Tax some time ag
ulo-10 check digit to
safeguard a seven-
digit number. The
technique it selected
was to multiply the
first digit by 7, the
second by 6 and so
forth until the last
digit was multiplied
by 1. It then used
the Modulo-10 com-
plement of the an-
swer as the check
digit and placed it
after the seventh
number.

The system worked li
number 1234567:

Account Number:
Check Digit Multiplier
Check Digit Computat

1 x 7 = 7
2 x 7 = 12
3 x 5 = 15
4 x 4 = 16
5 x 3 = 15
6 x 2 = 12
7 x 1 = 7

Total = 84
Mod-10 = 4
10 Comple

Therefore, the numb
check digit for 123456

The system was expe
gle-digit errors in any n
catch transpositions o
were, it seemed, six
tions to be considered
the first and second, b
and third and so on.

System Wea

However, in practice,
lived up to expectation
position, previously
found. This was betwe
check digits.

Thus, in the case o
123456 + 6 developed

Don't Break Up AT&T — Just Break Up Its Monopoly

By Joe Wright
Special to Computerworld

Some readers may have viewed my article, "Damning AT&T and IBM in One Breath a Mistake [CW, Nov. 20] as an attack on AT&T and probably concluded, for instance, that I applaud the antitrust suit recently filed against AT&T. They're wrong on both counts.

In fact, AT&T deserves quite a bit of praise. Its achievements are authentic. One only has to compare phone service in the U.S. to that in other countries to see the magnitude of its technological and service achievements.

In most, if not all, other countries, telecommunications is government-owned and -operated. Here in the U.S., it is at least "only" regulated. Lesson: the freer from government controls an enterprise is, the more likely it is to be efficient and innovative and a provider of quality products and services.

What I was attacking in that article was the monopoly position of AT&T. I maintain no business has a right to bar competition, for that is a breach of free enterprise and should be stopped.

Reader Commentary

I said AT&T's monopoly position had led to a decline in the quality of service. However, I did not imply by this that service quality is now in a decline.

A monopoly position in which a company is not just the only supplier of a service or product but, through the power of government, can *prohibit* competition creates a situation ripe for stagnation and avoidance of expensive technological advances. Faced with complaints about service, such a supplier can cavalierly tell you that if you don't like it, go somewhere else — with full knowledge that there is nowhere else to go.

In short, lack of competition with AT&T has removed one very strong incentive — although not all incentives — to higher quality of service, technological progress and diversity of services. For instance, it is predominantly due to such limited competition that has arisen that AT&T is offering its Digital Data Service, new types and colors of telephones, high/low pricing, etc.

Break Up AT&T?

Recognizing the efficiencies that can be derived from vertical integration, I don't advocate breaking up AT&T. But I do advocate breaking up its government-provided monopoly position.

The recently filed antitrust suit seeks to do both. I'm opposed to it.

Antitrust is a notorious contradiction of property rights and its history is one of incredible irrationality and injustice. The function and goal of antitrust is the sacrifice of ingenuity, ability and success to mediocrity, incompetence and failure.

All antitrust laws should be repealed, freeing every business to grow as big as ability, competence and economic competitions will allow.

Whether the object of an antitrust suit is a noncoercive "monopoly" like IBM or a coercive monopoly like AT&T, in the name of property rights and free trade the suit should be opposed. Antitrust has wrought more economic destruction than any monopoly ever has or could.

In a free society you don't have to deal with a monopoly — you always have the power of the pocketbook. But who can defend himself against the irrational, contradictory and unjudicable antitrust laws?

As I have urged IBM, I would now urge AT&T: Fight, fight, fight! Run these hack Justice Department antitrust lawyers in circles — load them down with piles of paper and a maze of paperwork that they, as bureaucrats, fully deserve. Arm yourself to the teeth with facts, figures and arguments. Speak with self-confidence and moral certainty.

But — and I emphasize this — don't plead your case on the basis of your "right" to be the only telecommunications company. No one has the right to a legally closed market. If you take this tack you'll lose your corporate shirt.

IBM Attempting To Diminish Cash

(Continued from Page 13)

has historically been a growth stock, rather than an income stock. At today's annualized dividend rate and market stock price, IBM yields about 3.9%. To reduce its cash, IBM could easily increase its cash dividend payout by a factor of two or three, suddenly making the stock a highly respectable income producer for shareholders.

Indeed, it would seem IBM's future income-producing abilities now surpass its business growth possibilities. Thousands of rental machines pour regular monthly revenue into IBM's bank accounts. Much of this revenue is now charged to depreciation, rather than being added to earnings. In 1974, depreciation charges were $1.86 billion, slightly more than net earnings of $1.84 billion.

With the apparent postponement of FS technology, existing 370 equipment could be in use in the field creating income long after it has been fully depreciated on IBM's books. Dollars which formerly had been charged to depreciation would then show up as earnings.

Fat dividends could be paid from the cash hoard and could be sustained by the increased earnings. In the process, IBM might finally be able to diminish its embarrassment of riches.



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370/145	✓	✓	✓		
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SOFTWARE&SERVICES

Regional CPE Meetings Set for S.F., Atlanta

Regional meetings to compare computer performance evaluation (CPE) tools and techniques have very clearly taken hold.

The Measurement and Evaluation Group – based in San Francisco – has scheduled its third meeting for Wednesday, Oct. 15. The time and location of this session are available from Bruce Grant at Stauffer Chemical, One Embarcadero Center, San Francisco, 94111.

Closer in time is the organizational meeting of the Southeastern Regional Computer Measurement Group – an outgrowth of the Comress-sponsored meeting last month [CW, Aug. 6] – in Atlanta on Sept. 22

Essentially a planning meeting, it will have to be limited in size, but anyone interested in attending may contact Bob Bishop at Comress, 2480 Windy Hill Road, in Marietta, Ga. 30062.

Random Notes

Varian 620, V70 Minis Get 'Higher Operating System'

ELMSFORD, N.Y. – Programs can be written and debugged faster and easier than before on Varian 620 and V70 minicomputers using the Fortran-based Higher Operating System, according to its vendor, Information Displays, Inc. (IDI).

Higher employs dynamic memory allocation so large systems of programs can be executed without concern for memory size or overlay structure, IDI explained.

Higher features a control language, file system, I/O device independence, a Fortran compiler, job isolation, interrupt processing and debugging facilities.

The software can run in a 16K memory with a 500K disk and a high-speed binary input device.

Higher is available for $4,000 including training and installation, IDI said from 150 Clearbrook Road, 10523.

Reality System Gains Basic

IRVINE, Calif. – Microdata Corp. has added an extended version of Dartmouth Basic language, called Data Basic, to its Reality system to act as a programming facility for use with the existing data base management system.

Reality's main purpose as a small business computer system is to fulfill a transaction-oriented information management function. The addition of Data/Basic will reduce the development time for applications and will provide increased efficiency.

The company is at 17481 Red Hill Ave., 92705.

One Year Later, Atsu Is Still Growing

By Don Leavitt
Of the CW Staff

NEW YORK – One year after a pair of time-sharing users proposed the formation of a special interest group, the Association of Time-Sharing Users (Atsu) has 700 paid-up members and is still growing, according to the group's president, Hillel Segal of Hertz Corp.

The purpose of Atsu was – and still is – to foster an interchange of users' ideas and experiences with commercial time-sharing vendors. Early on, Segal and the other founders hoped to develop generalized benchmark programs by which the various vendors could be evaluated objectively.

That goal hasn't been attained, Segal acknowledged recently, and users are still left with a maze of confusing rate schedules and service offerings. But Atsu has established approximately 20 local chapters and special interest groups to help end the confusion.

Another move toward ending that confusion may be under way. Recently the national board of directors invited representatives of the local chapters to come to New York for a seminar on cost analysis of time-sharing service.

The presentation was made by an independent consultant and, if the invited attendees approve, Atsu will sponsor the seminar in each of the chapter cities.

User, Vendor Membership

The chapters, located in many of the metropolitan areas across the country, hold regular – often monthly – meetings which include panel discussions by users on how to choose a vendor and presentations by network vendors of new services and by terminal vendors of their new equipment.

To encourage cooperation rather than contention between users and vendors, membership in Atsu is open to both. Associate members – "individuals primarily involved in the sale of time-sharing services" – are not permitted to hold office or vote, but are welcome to participate in all other Atsu activities, Segal said.

Activities open to the members include contributing to a monthly newsletter and preparing presentations for the group's national meeting, in addition to participation in the local chapter meetings.

They are also encouraged to respond honestly "and promptly" to surveys put out by or with the cooperation of the national organizations, Segal said.

The most important of these surveys, in his view, will be the one run by Datapro Research Corp. to get user evaluations of the vendors' services and support. Published in one of Datapro's "A Buyers Guide to . . ." reports, ratings in past years have been faulted for being based on too few user responses, Segal noted.

To overcome that complaint and make the ratings more useful to Datapro subscribers and Atsu members, Segal urged them all to answer the questionnaire when it is distributed next year.

The cooperation works both ways, he admitted, since Datapro provides copies of its report to all new Atsu members.

The association plans to publish a directory of time-sharing services later this year. It will be geographically oriented, Segal said.

Another directory, covering actual remote-computing services available, may be published later, but the first effort will be to let users know where personal help really is available, he said.

"A lot of the vendors have In-Wats service and that's fine if you know what you're doing, but it's not much help if you don't," he explained.

The fee for Atsu membership is $20 for both regular and associate categories. The association's mailing address is 210 Fifth Ave., 10010.

'Oscar' Aids Schedule Planning Provides Prior Work Review

ATLANTA – IBM installations with 64K bytes of memory, two tape drives and a disk unit can schedule workloads for the future and document how well work was handled in the past with the Operations Scheduling and Reporting System (Oscar) from Computer Concepts Corp.

Developed jointly by the vendor and the Trust Co. of Georgia, Oscar is not as sophisticated as some schedulers on the market, but neither – at $5,000 – is it as expensive, a spokesman noted.

Oscar maintains a data base of information about jobs that are to be run at the user installation. Using this base, it generates reports for the operating personnel indicating jobs scheduled to be run during the target period.

Linked into a job-accounting routine, the system can report jobs scheduled but not run in prior time slots as well as provide daily and monthly performance statistics.

To get schedules from Oscar, the user inputs basic information about the jobs that are to be run, their peripheral requirements, processing frequency, sequence and partition.

The software makes no attempt at optimizing the job mix, as some of Oscar's competitors do. This is, however, only a minor shortcoming for most installations, the spokesman argued, since few sites reevaluation of the schedule worthwhile.

Oscar can handle more than one set of accounting periods, company holidays and business days and multiple CPUs – with as many as 15 initiators or partitions scheduled on each, according to the company.

Made up of six ANS Cobol programs, Oscar will be delivered by mail for $5,000 or supported by three days of on-site vendor training for $6,000.

Computer Concepts Corp. is at 6244A New Peachtree Road, 30340.

Bomp Programs Linked to IDMS

WELLESLEY, Mass. – A software package providing a "bridge" between IBM's Bill-of-Materials Processor (Bomp) and Cullinane Corp.'s data base management system, IDMS, has been developed by Cullinane and is now available as part of IDMS.

This package should help in developing application systems under IDMS, especially those where IBM's Bomp, Dbomp, MRP or CFMS packages are currently in use, Cullinane said.

Included with IDMS at no additional charge to the users, the package consists of a manufacturing bill-of-materials prototype program, a bridge program to interface IBM's bill processor retrieval programs to the IDMS data base and a documentation package.

The bill-of-materials prototype program indicates the sequence and structure of data base access needed to perform normal bill-of-material functions against an IDMS manufacturing data base.

This program, written in ANS Cobol, keeps data manipulation logic at a minimum in order to avoid obscuring data base logic and is of significant value in converting Bomp, Dbomp, MRP or CFMS programs to IDMS, the vendor claimed.

The bridge program will permit applications programs designed to operate with Bomp, Dbomp, MRP or CFMS and which perform retrieval and update functions to operate without change or recompilation with an IDMS data base.

IDMS itself – including the Bomp bridge – is available for $40,000. The generalized communications interface costs an additional $10,000 and the Culprit report writer linked to IDMS is another $20,000 – but neither of these extra cost options are required for the Bomp-IDMS bridge operations, Cullinane said from 20 Williams St., 02181.



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'Swapper' Enforces Use of Cobol Standards

GLEN ELLYN, Ill. – IBM-based shops with 50K to 70K bytes of main storage can use the Swapper package from Systech to standardize Cobol programming throughout the installation.

With this support, each worker can code in the way most comfortable to him, but the final result will comply with installation standards, Systech noted.

Swapper cuts down the amount of coding required by the programmer because it supports the use of abbreviations which are expanded into full Cobol terms by the preprocessor. Unlike some similar packages, however, this one does not force the use of predetermined abbreviations of its own; the user defines only those he wants to use.

With Swapper, an ascending numerical prefix can be appended to all paragraph names but, again, this is a user option. So is a facility that recalculates data division level numbers, using any one of five increments the user designates.

Handles Indentation Chore

Indentation is another chore Swapper handles, the vendor said. Data division entries can be set in as many as 10 levels deep and nested IF statements in the procedure division are also indented by the system.

Review of the IF indentations can sometimes pinpoint logic flaws, Systech noted.

Uniform placement of elements common to Cobol programs includes positioning of PICTURE, USAGE, VALUE at predetermined target locations "whenever possible."

Swapper also stacks multiple receiving or object fields of the OPEN, MOVE, USING, GO TO . . . DEPENDING, and CLOSE verbs.

In addition, the software correctly positions "wandering periods, commas and parentheses," the vendor said.

Swapper breaks lengthly run-together statements into verb/object relationships and deletes superfluous reserved words, a spokesman added.

Output from Swapper can be printed, punched or written to a user work file on either disk or tape.

Written in ANS Cobol, the package is available now for a one-time charge of $1,495 from Systech at 356 Windsor Drive, 60137.

Tymshare Network Aids Micro Users

CUPERTINO, Calif. – Tymshare, Inc. has installed assembler/simulator software on its Tymnet network for the Texas Instruments (TI) TMS1000 microcomputer and TMS8080 microprocessor and for the Motorola M6800 microprocessors.

Developed by TI's semiconductor group, the TI microchip programming aids run on Tymshare's Tymcom-370 systems.

The Motorola assembler/simulator package, developed by Wintek Corp. of Lafayette, Ind., is designed for Tymcom-X systems employed by Tymshare.

The microprogramming software aids provide users with an on-line program development capability whenever needed anywhere along the 80-city Tymnet network in the U.S. and western Europe, Tymshare noted.

The interactive, time-sharing environment of Tymnet allows users to work with Tymshare's text-editing program, Editor. With it, the designer can create source and data files, correct errors and make changes to the source code

Tymshare is based at 20705 Valley Green Drive, 95014.

Trendata 4000 Gains Plotting

SUNNYVALE, Calif. – Trendata has a host-resident plotting software and support package for use with its 30 char./sec Model 4000 terminals equipped with an optional plot hardware feature.

The package, on paper tape or punched cards, is written in Fortran and is compatible with the software and CALLing standards of California Computer Products, Inc. equipment.

Transferable from one host CPU to another, the software – and the optional plot feature – can be leased for $5/mo from Trendata at 610 Palomar Ave., 94086.

Spanish 'Spoken' Here

CARACAS, Venezuela – With documentation for installation and operation translated into Spanish, the Libra DOS/VS partition balancer from Datachron Corp. of New York City and the CBL-short preprocessor and other packages from General Electronics of Lyons, Ill., are now being marketed in South America by Computaciones Lubell.

The marketing firm can be reached at Apartado 14105, here in Caracas, 101.

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Add ENDIF, ENDPERFORM, Ad Hoc Committee Tells Codasyl

OSSINING, N.Y. – Cobol should be extended "at the earliest practical time" to include two features which "would greatly facilitate the writing of structured programs," according to Daniel D. McCracken, author and consultant.

Concepts and Techniques

One feature, an ENDIF operator, "is badly needed to clarify the scope of control of the IF statement," he said in a recent letter to Codasyl's Programming Languages Committee – the voluntary group responsible for the definition and maintenance of Cobol.

In the second place, McCracken said, "the PERFORM verb should be modified to permit the controlled code to be in-line, immediately following the PERFORM. This would necessitate the introduction of an END-PER-FORM operator."

The two suggestions were made by McCracken "as chairman of the Structured Cobol Committee, a strictly ad hoc organization that grew out of conversations at the IEEE Computer Society workshop on structured programming at Lake Arrowhead last September," he told Codasyl.

According to a list attached to McCracken's letter, there are 17 members of his committee. Six "concur with these recommendations. Two members declined to support them on the grounds they would like to see very much more extensive changes in the language.

"The remaining members did not respond," he said.

Ends Awkward Situations

The ENDIF operator would eliminate a number of awkward situations that frequently arise and would tend to reduce programming errors, the consultant claimed, adding "it would also be helpful if termination operators were available for the AT END, ON SIZE ERROR and INVALID KEY phrases."

The ENDPERFORM operator "would clarify program relationships by greatly reducing the number of paragraphs that exist solely because of the syntactic requirements of PERFORM... UNTIL and PERFORM... VARYING options." Codasyl was told.

The members who support these recommendations feel the ENDIF operator is the highest priority item, followed by the in-line PERFORM and then the termination operators for the other phrases, McCracken noted.

"A proposal to recommend a CASE structure to you met with little enthusiasm," he admitted to Codasyl. The ad hoc group felt the need for such a structure has been "exaggerated," he said.

He closed his letter with the thought that his recommendation was a modest change which would greatly facilitate structured programming in Cobol "without changing the language into something unrecognizable as Cobol and which would have the appearance of a cut-down version of PL/I."

Keane Sets DBMS Slate

WELLESLEY, Mass. – Keane Associates, Inc. has scheduled a series of seminars related to data base management systems (DBMS) for presentation in the Boston area later this month and October.

"Concepts for Management" will be essentially nontechnical, concentrating more on costs and benefits of the systems than on specific features. This one-day course will be held next Wednesday, Sept. 24, and costs $200 per attendee.

Evaluation of the major systems now on the market will be the focus of the two-day "Introduction to Data Base Concepts". This $350 course is scheduled for Oct. 15-16.

Getting down to specifics, "Designing an IMS Data Base" is intended for data base administrators and analysts in shops that have already made a commitment to the IBM-marketed system.

Running three days, this course starts Sept. 29 and ends Oct. 1 and costs $500 per person.

Programmers experienced in Cobol, PL/I or Assembler are the students expected in the "Programming for IMS and DL/I" two-day course scheduled for Tuesday and Wednesday of next week, Sept. 22-23. Places in this seminar can be reserved for $250 each.

Keane is at 36 Washington St., 02181.

Comment Creates Visible Period

By Theodore G. Budrow
Special to Computerworld

William B. Simmons' article on the use of the "structured period" [CW, Aug. 20] mentioned one drawback – that of having a space before the period which "is nonstandard, and may be treated differently by different compilers."

If a particular compiler does not allow the space-period format, the same visual effect could be achieved by using a line of coding which is blank except for asterisks in columns 7 and 12 or an asterisk in column 7 and a period in column 12.

Since the first asterisk denotes a comment line and everything in that line is not considered by the compiler, the visual logic break could actually do more [than Simmons' period] by including some explanatory data as well.

With the comment line approach, a real period would, of course, have to be used in its proper place so the compiler will "know" when the programmer's logic actually breaks.

Budrow is a programmer at Read's, Inc., Baltimore Md.

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COMMUNICATIONS

Coast-to-Coast Datadial User Reports Savings

By Ronald A. Frank
Of the CW Staff

NEW YORK – One of the first coast-to-coast users of the Data Transmission Co.'s (Datran) Datadial service has reported he is saving money and improving his operations.

Republic Financial Services of Dallas is using Datadial to transmit fire and homeowner policy information from Dallas to New York and Los Angeles, according to its vice-president, Earl Young.

Speaking at a session of Info 75 in New York last week, Young said a 100-mile, five-minute call on Datadial at 2,400 bit/sec costs 8 cents. The same data transmitted on Wats lines is $1.75 and on a dial-up call the cost is $1.45.

Republic is also currently using Datran to transmit data to Baltimore, Philadelphia, Detroit, St. Louis, Chicago, Kansas City and Tulsa. And the company plans to convert from Bell lines to Datran as soon as service is available in Denver, Milwaukee and Atlanta.

If intrastate tariff problems get resolved in California, Republic will also use the new carrier for transmissions to San Francisco and San Diego.

The company has been using Datran facilities since January of this year, so it is not yet possible to quote exact dollar savings, Young said. He estimated, however, that the new facilities will cost about 25% less than Bell lines, but called this a "conservative projection."

All of the insurance data is being transmitted at 2,400 bit/sec from key entry equipment supplied by Computer Machinery Corp. (CMC) to a Honeywell 7500 intelligent terminal. An on-line software system from Cybertec is being installed that will operate on an IBM 360/65 in Northbrook, Ill., Young said.

Data sent from Dallas is entered on Four Phase CRTs while batch data is handled on Data 100 terminals. A 9,600 bit/sec line is used which is operated in split-stream mode driving two 4,800 bit/sec lines.

The on-line CRT operation is used for input and inquiry while the batch operation handles program assembly and checkout functions, Young said. The company also is installing a Honeywell 2050A mainframe and all data transmission operations will be transferred from the CMC equipment to the CPU by the end of this year.

No More Restarts

Before Republic switched to Datran, high error counts were being experienced on its Bell lines, Young said. In many instances "restarts" were required which meant "constant surveillance by an operator."

With the Datran facilities, the company has "encountered no restarts and transmission is virtually error-free," he said. There has been only one period of downtime – when a storm knocked out a Datran microwave tower, causing an outage of four hours.

Initially there were some errors when the Datran lines were installed but, when the Bell local loops were brought up to Datran standards, most of the problems were eliminated, Young said.

The average call setup time on Datadial is "less than one second – a vast improvement over the 10 to 20 seconds required to complete a DDD or Wats" call, he said. The Datadial billing increment is one second – 59 seconds less than that offered by the established carriers, he said.

A major feature of Datadial is "camp-on call back" which is not available on either DDD or Wats, he said. Datadial is available at speeds up to 9,600 bit/sec "unlike the 3,600- to 4,800 bit/sec range offered by the other carriers," he said.

Clear-to-send time on Datadial "was guaranteed at .2 msec," which was a considerably shorter interval than the 150 to 200 msec interval experienced on telephone company lines, Young said.

With 'Profit' System

Bank's DP Work Accomplished With Remote Terminals

OBERLIN, Ohio – The Oberlin Savings Bank uses software developed in Cleveland, run on a CPU in North Carolina and accessed by terminals in Ohio to get its DP work done.

The bank uses CRTs supplied by Applied Digital Data Systems, Inc. (Adds) to access a data base stored on an NCR Century 251 mainframe at Wachovia Services, Inc. in Winston-Salem, N.C.

Oberlin's DP system, which went into operation last November, makes use of a customer information file plus marketing, accounting and management reports in a single package. The system, called Profit, was developed by Central National Bank of Cleveland.

"The key advantage of the Profit system is that we receive accounting and management data and also a central information file about our customers," Raymond D. Campbell, Oberlin Savings' president, said.

"We can use this information without having to invest heavily in computer hardware, software or an expensive staff to operate and maintain it," he added.

The remote equipment used is an NCR 399-670 data capture unit which includes a Micr reader/sorter, processing unit, line printer and card reader.

This processor reads, prints and sorts Micr documents while recording the information on a tape cassette. The cassette is then used to transmit the data to the NCR 251 computer in North Carolina.

The on-line CRT terminals with printers are used to retrieve data from the central data base; the printer is available to make a hard copy of information displayed on the screen.

Cost Difference

"The difference in cost between having our own computer and using Profit is tremendous," Campbell said. "We were able to take untrained personnel and teach them to operate the equipment in a matter of weeks. Maintenance of the mainframe and central software is entirely the responsibility of Wachovia Services, Inc. in Winston-Salem."

The Profit system itself differs markedly from a number of other packages on the market. Profit provides a true central information file system with additional accounting, management and marketing capabilities. And its adaptability to electronic funds transfer systems is another plus," Campbell added.

Central National assumes full responsibility for the installation and maintenance of the Profit system and hardware. The subscribing bank captures and transmits data directly to the main processing unit from an on-premises input station. The information is carried by leased communications circuits to the main computer center where all processing is actually done. The master files are updated and information is transmitted back to the bank for the generation of printed reports, statements and letters.

On-line terminals are located at teller stations and other key points in Oberlin's main office and four branch offices. These provide access to the main computer's master file at any time. A paper copy of information displayed on the CRT screen may be obtained whenever desired from an adjacent high-speed printer.

With Profit, funds may be transferred automatically from account to account following insertion of transfer instructions on the account records. The system, for example, will transfer interest credited to savings accounts or certificates to a customer's checking account and generate appropriate debit and credit reports without further attention by the bank's staff. This capability permits the system to accommodate the variety of electronic funds transfer applications currently proposed or under development.

Intertel Network Control System Gets Secondary Channel Option

BURLINGTON, Mass. – Intertel, Inc. has announced a 150 bit/sec secondary channel option for the company's Network Control System.

The option, which works with all Intertel modems from 1,200 to 9,600 bit/sec, cuts line costs nearly in half for users who now have 150 bit/sec lines and high-speed lines servicing the same sites in a real-time on-line data network, the company said.

Typical applications include Teletype networks for administrative messages, low-speed printers, security systems and process monitoring.

Line savings of almost 50% are said to be possible. The option frequency-division multiplexes 150 bit/sec data or administrative messages with high-speed data on the same lines used for high-speed data, thus eliminating the 150 bit/sec lines.

These lower speed lines cost nearly as much as the high-speed data lines, the company said.

If a user now spends $1,200/mo for voice-grade private lines and $900 for 150 bit/sec lines, he can save at least $900/mo ($10,000/year) by installing a Network Control System with secondary channel.

The cost of the side channel option is less than $800 with a two-year lease priced at $21/mo, Intertel said from 6 Vine Brook Park, 01803.

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(below) *AJ 841*, the rugged Selectronic™ printer terminal. A cost effective replacement for the IBM 2741.



(right) *AJ 230*, a mobile acoustic Teletype terminal. (Also available in auto-answer and TWX/DDD versions).

(below) *AJ 630*, a 30 cps quiet non-impact printer terminal with 140 character print line. (APL is an option).





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Space to Work

ELMSFORD, N.Y. A workstation designed for the Teletype Dataspeed 40 series of keyboard displays and printers has been developed by MCS Designs, a subsidiary of Mini-Computer Systems, Inc.

The Deskware unit is said to place the operator closer to the keyboard, which is recessed, and provides a broad wing on which to place work materials as well as a shelf for storage of paper, pocketbooks, etc.

For Dataspeed 40 users without the optional printer, there are work areas on both sides of the keyboard.

The Deskware workstation is priced at $220 from Mini-Computer Systems at 525 Executive Blvd., 10523.

IBM 3416, 'Magna Carta' Serve 34,000 Clients

BELLEVILLE, Ill. – Customers at the First National Bank here can automatically get cash and perform other bank transactions through an IBM 3614 terminal.

The bank is said to be one of the first commercial banks in the nation to process customer transactions with the 3614 consumer transaction facility.

Using a magnetic stripe identification card, customers can withdraw funds from their checking and savings accounts, as well as check balances in those accounts. Additional features being added later this summer will include the ability to make deposits and transfer funds between accounts.

To use the 3614, a customer inserts his card into the terminal, which is linked to a 370/135. After the card is validated, a display panel instructs the customer to key in a personal identification number.

Guided by messages on the display, the customer presses a series of keys to indicate the transaction and its amount.

Some 34,000 customers of the bank are eligible to use the service via a specially designed card known as the "Magna Carta." The dark blue card is embossed with the customer's name and a special account number.

"Considerable thought was given to the selection of the name for the card," G. Thomas Andes, executive vice-president, said. "It is hoped the Magna Carta card will be used by other banks as they enter the electronic funds transfer banking network, therefore allowing an interchange of bank cards on automated teller machines some day.

Terminal Transactions



To use the IBM 3614 at the First National Bank, a customer inserts the Magna Carta magnetic stripe card into the terminal, which is linked to a 370/135.

"The 3614 is simple to operate, and a customer can transact business quickly," Andes said. "The facility also helps eliminate paperwork, which is beneficial both to customers and the bank.

"Customers don't have to spend time filling out withdrawal slips and stand in line for a teller. Our staff has that much less paperwork to handle and in this business, that's important," he said.

CCMI Data Base Has Toll Telephone Prices

RAMSEY, N.J. – For communications users planning or upgrading their networks, the Center for Communications Management, Inc. (CCMI) has developed a data base for toll phone rates and Wats evaluation/analysis.

Each of the 29,000 rate centers in North America and the Caribbean are identified on IBM-compatible tape for users to run on their in-house CPUs.

The basic rate center tape file includes the world numbering plan for identification of directly dialed calls. These are organized sequentially according to area code and central office.

Each central office and area code record contains applicable V and H coordinates, time zone codes, rate center name and country identification. The 9-track Ebcdic tape is arranged sequentially by area codes and central offices and is available in either 800- or 1,600 bit/in. format.

The data base is updated at regular intervals to keep track of rate center changes. The data base tape costs $225. Updates cost $200 semiannually, $150 quarterly or $100 monthly from CCMI at Box 324, 07446.

Azurdata Collection Unit Lighter Than Three Pounds

RICHLAND, Wash. – Azurdata, Inc. has introduced the Infopac 1½ portable data terminal.

The portable terminal is self-contained and includes a battery pack. It weighs less than three pounds and is hand-held.

The 4K-character capacity memory is solid-state and can be expanded in increments up to 64K-characters.

A built-in keyboard provides function keys and numeric and special character data entry keys. Entries can also be made with an optical wand-type reader.

Entered data is shown on an LED display for verification and correction, if necessary, before advancing to the next and blank unit record.

Among other "user-requested" features are a built-in auxiliary power supply to protect against loss of data in memory, variable record lengths, error prevention features with audible alarms, remote data input capability and fast dump capability.

Price of the standard data terminal is $1,350 with a one-year warranty. The firm is at 1305 Mansfield Ave., 99352.

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Stores Users' Specs in Data Base

Bell Canada Initiates Dataroute Maintenance Programs

ST. JOHN'S, Nfld. – The Computer Communications Group of Bell Canada has initiated several maintenance programs to keep its digital Dataroute and other customers in operation, according to Brian Hewat, assistant vice-president for systems, who spoke at a recent regional conference here of the Canadian Data Processing Management Association.

With a new trouble report information-handling system, Bell Canada has computerized all of the system design specifications for major users and has stored them in a data base.

It is now possible, literally at the press of a button, to call up on a CRT screen the relevant information regarding a particular system, in any one of a number of locations, making it is easier to diagnose and fix a problem, Hewat said.

In addition, the Dataroute alarm reporting and control system allows automatic monitoring and pinpointing of problems on the network. In some cases, problems have been discovered and diagnosed before the user was aware of them, Hewat said.

The next step in Canadian digital network offerings will be the Datapac packet-switched network scheduled to begin operations in mid-1976

Packet Mode Foremost

There will be a number of modes of operation in the Datapac network, but the prime mode will be the packet mode.

Packet switching is best described in comparison with circuit switching, in which there is a physical link between the two ends of a communication for the duration of that communication, Hewat explained.

In packet switching, there is no permanent physical link. The data is broken up into standard-format packets, which are sent through the network to their destinations by means of special address codes.

Error-checking protocols are built-in, checking the accuracy every step of the way and automatically ordering instant retransmission if there is an error. This results in a level of accuracy not obtainable before, he said.

The Datapac network is designed to become the universal network for data communications, much as the telephone network is for voice communications. As with the telephone network, it will be a shared network, available on a fee-for-use basis.

The economies of such a network are readily apparent, Hewat said. With many users sharing the system, costs to each will be considerably lower than if they had their own private networks.

End of Waste

One common network will eliminate the "wasteful proliferation" of private networks, many of which span the same areas and undertake similar functions, but are in use to only a fraction of their capacity, he said.

In addition, a shared network can afford the diagnostic equipment, the standby equipment and the alternate-routing capability to ensure full reliability. These would be possible, but very costly, on a private network, he noted.

Perhaps most significant is the fairly obvious need for interconnection of private networks in the years to come, Hewat said. We know for instance, that Canada is moving towards an integrated electronic funds transfer system. This can only be done with some integration of the networks used by each of our financial institutions.

"Joining together a number of private networks is not the way to do it efficiently. The development of one common network is the way to do it, both efficiently and economically," he predicted.

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Sycor 250 Expanded With Control Station

ANN ARBOR, Mich. – Sycor, Inc. has expanded its on-line Sycor 250 intelligent display system by adding a control station which incorporates a control unit and a display station in a single enclosure.

The Sycor 258 control station is less expensive than a comparable Sycor clustered display station with an independent control unit, the company said.

An optional device adapter may be installed in the Sycor 258 to expand support for up to 23 display stations and printers using daisy chaining or 12 devices using point-to-point cabling.

The Sycor 258 control station is priced at $172/mo on a one-year lease, including maintenance, for a 480-character display station.

This compares with $219/mo for a 480-character display station and independent control unit. The purchase price of the 480-character unit is $5,400.

The price of a 1,920-character control station is $233/mo on a one-year lease, including maintenance, compared with $273/mo for a 1,920-character display station and controller.

The purchase price of the 1,920 character unit is $6,700. Deliveries for the Sycor 258 control stations are expected next January from the company at 100 Phoenix Drive, 48104.

Sanders Booklet Provides Introduction to SNA, SDLC

NASHUA, N.H. – An introduction to IBM's Systems Network Architecture (SNA) and Synchronous Data Link Control (SDLC) is available in a booklet from Sanders Data Systems.

The handbook describes what SNA is, what its components are and some of its benefits and drawbacks, according to Sanders.

The information is designed to aid the user in evaluating the applicability of SNA to his teleprocessing requirements and includes a glossary of SNA terms, Sanders said.

The booklet is available for $1 from Sanders Data Systems, NHQ 1-401, 03060.

For 370/135 Under DOS/VS

User Finds Independent's Memory a Temporary Solution

MARTINVILLE, Va. – An independent vendor's add-on memory proved to be an interim solution for an IBM 370/135 user here running under DOS/VS.

Although the additional memory was only installed in April, Tully Corp. has decided it needs both more "horsepower" and more memory and will upgrade to an IBM 370/145 in October.

Tully, an apparel manufacturer, had been running three or four partitions on its 256K 135, recalled James H. Ferguson, information services manager.

But the firm wanted to add a data base management system and remote job entry (RJE) capability, Ferguson said.

The firm was also interested in expanding its on-line inquiry use of IBM 3270s to on-line order entry.

Even without the additional load, though, the 135's high paging rate was an indication the CPU didn't have enough memory for its current workload.

Although the firm came to the conclusion that memory, not horsepower, was what it needed, "we also suspected we were about out of cycles and . . . ought to have a faster machine," Ferguson said.

But, "the economic situation was such that we didn't want a larger machine unless we had to," he remarked.

"If you have a high paging rate, it's difficult to measure your CPU utilization or what it would be if you had enough memory," he observed.

The shop's 135 had originally had 144K, but had grown with two additions of IBM add-on memory. The latter step had carried the CPU up to 256K with installation of IBM's Advanced Bipolar Memory (ABM).

Lower Cost Alternative

The IBM add-on memory had been "excellent," but the shop was concerned with price and decided to keep looking for a lower cost alternative for its latest memory requirement.

Tully finally chose an upgrade from 256K to 384K with Memorex 6135 add-on memory. Tully leases the memory from DPF, Inc. of Hartsdale, N.Y., at a rate about 44% less than the comparable IBM price, Ferguson said.

"It took about a week and a half to get the memory up properly," Ferguson recalled. "It hooks right into the IBM error correction logic," he said. "There were some single-bit and double-bit errors for a while, but they are gone now," Ferguson said.

The shop noticed a throughput gain because paging was no longer a factor and is not a factor now," Ferguson said.

Tully was able to implement the on-line data entry system with 10 CRTs running under the IBM Customer Information Control System (CICS). The 135 also provides a partition for RJE usage and provides two batch-testing partitions during the day.

At night the shop runs two or three production partitions, handling financial and inventory applications, Ferguson said.

Ran Out of Cycles

After putting on the additional applications, the shop found it had indeed run out of cycles. Because it both needs the capacity and has plans for more applications, the firm plans to lease a 512K IBM 370/145 in October.

The 145 will come from Computer Systems of America (CSA) in Boston, where Tully leased the 135. The Memorex add-on memory will go back to CSA with the 135.

The Memorex add-on memory has proved "fine" in terms of reliability and service, Ferguson said. Tully already had Memorex servicing six spindles of Memorex 3330-compatible disk drives.

The shop also has six IBM 3420 tape drives. IBM maintains the CPU and the drives, and Memorex takes care of the add-on memory and disks, Ferguson said.

DP Aids Newspaper Payment Collection

WASHINGTON, D.C. – The toughest problem for newspaper carriers is collecting from customers. The biggest headache for customers is paying carriers. And publishers worry about the combination of carriers' problems and customers' headaches.

The *Washington Star-News* said it is going to do something about the situation. It is giving customers a chance to pay computers instead of carriers.

In an average month, the *Star-News* said it loses about 300 of its 6,000 carriers, primarily because of collection problems. Furthermore, the paper noted this 5% turnover rate is probably typical of most U.S. big-city dailies. On the other hand, the vast majority of customer complaints are about carrier delivery and collection, the *Star-News* said.

Computers can help to solve the problem, said Harold Lowder, director of data processing for the *Star-News*. He said his publication has computerized what it calls "preferred customer accounts" so subscribers can make payments directly to the *Star-News* and have the collections automatically processed and recorded.

Eliminating the Problem

"There's nothing new about letting subscribers pay directly to the paper instead of to the carrier," Lowder said. "But every paper that does it considers it a problem. We're trying to eliminate the problem."

The *Star-News* systems permits subscribers to start a preferred customer account by paying the paper directly for a minimum period of eight weeks in advance. Thereafter, customers receive bills at regular intervals.

If a customer stops delivery for vacation, or reports undelivered papers, his account is credited automatically. Carriers don't have to collect from preferred account customers but they still earn their customary delivery fee of 5.5 cents for each daily paper and 10 cents for each Sunday edition.

Records for preferred account customers are stored on a Honeywell Model 2040 computer system in the *Star-News* building here. When customers call to make inquiries or request changes in service, clerks in the accounting department have immediate access to the records on a CRT terminal. Operators can check a customer's last six transactions, details of his most recent billing and the history of delivery stops and starts.

Quicker Answers

The system has improved customer relations considerably, Lowder said. "Before we began using this method, our subscribers became very frustrated and irritated waiting for us to check their records. Every time they called to ask a question, we had to hold them on the line while we searched one of our files. Now we get the information while we're talking to them."

Lowder said the *Star-News* expects that increased use of the preferred customer account by subscribers will reduce the turnover rate for carriers. In addition, he pointed out that advance payment gives the paper more cash with which to defray operating expenses, improves customer satisfaction and provides a competitive edge which may help the *Star-News* attract new subscribers.

The system will be even better in another month or so when the *Star-News* transfers its complete preferred customer records from computer tapes to disks, said Lowder. He said operators will then be able to correct and update customer records at the same time they check billing information.

The *Star-News* has about 20,000 of its 300,000 home-delivery subscribers in preferred customer accounts. The computer is capable of handling as many as 100,000 customers and, by upgrading the system, Lowder hopes to have at least half the total 407,000 circulation (including newsstand customers) paying directly to the *Star-News*.

"There are great advantages to the preferred customer account, but it takes a modern computerized system to make it work," Lowder said. "We've offered the service for a long time, but it was a problem for us and our customers until we got the right system in place."

From Cards to CRTs

Ten years ago, Lowder said, the *Star-News* handled preferred customer accounts with "thousands of computer cards." The only information available was a customer's name, address, delivery schedule and balance. Other details were kept in special files and record books.

Since then, the *Star-News* has steadily upgraded its DP operation and improved its ability to service preferred customer accounts. An IBM system purchased in 1961 was replaced by a Honeywell Model 200 in 1966. Two years later, processing was changed from cards to tape to increase speed. A Honeywell Model 1200 was installed to handle the job. Then, in 1972, the *Star-News* changed from a monthly to a weekly billing cycle. Finally, the *Star-News* upgraded to a Honeywell Model 2040 one year ago and converted to disk files last March.

Better Service

"The primary motivation in upgrading was to improve preferred customer account service," Lowder said. "We're convinced the problems can be solved and we believe this is the system to solve them."

The Honeywell system consists of a Model 2040 central processor with 131,000 characters of memory, four visual information projection terminals, four tape drives, three disk drives, a printer and a card reader/punch.

The *Star-News* uses the system for a variety of other applications besides preferred customer accounting. It is used by the accounting department for payroll processing, accounts receivable accounting, advertising billing procedures, market research surveys and classified advertising accounting.

In addition, the circulation department uses the computer for updating weekly delivery schedules. A political reporter even uses it to analyze election results.

"Variety is a key element in our DP operations," Lowder said. "We need to do several kinds of processing jobs, and this system gives us the flexibility we need."

Two Options Enhance Scan-Data 2250/1 OCR Unit

NORRISTOWN, Pa. – A continuous-feed option is said to enhance the ability of the Scan-Data Corp. 2250/1 optical character recognition (OCR) unit to process very large volumes of small documents having only one or two lines of data.

Scan-Data also announced an optional general-numerics recognition capability which reads most common line printer numeric character sets. The feature is said to be especially useful for turnaround applications such as utility bills.

The continuous-feed enhancement should allow the 2250/1 to process 3 in. by 6 in. turnaround documents at the rate of 400 document/min compared to a previous rate of about 150 document/min, a spokesman said.

Continuous feed is a combined hardware and software function which allows paper feeding to continue at a rate of 30 vertical in./sec. In the event that scanning cannot keep up with paper movement, the continuous-feed feature momentarily stops the paper, then automatically restarts it at the proper time.

The programming of the feature is "transparent" – a user states by simple parameter entries where data is located on each form, and the continuous feed option combines hardware and software operations to read the data in sequence as the paper passes.

The continuous feed option and the firm's 1,600 char./sec scanner option have a combined three-year monthly lease rate of $540. Maintenance is available at $150/mo.

The continuous feed option can be field installed and will be available in the first quarter.

The general numerics recognition capability has a three-year lease rate of $180/mo. Maintenance is $30/mo. Availability is also in the first quarter from the firm at 800 E. Main St., 19401.

OCR User Group Elects Officers

BOSTON – The Optical Character Recognition Users Association (OCRUA) elected A. Blair Jensen of Management Systems Corp. in Salt Lake City, Utah, as its 1975-1976 president at the group's recent summer conference here.

OCRUA is an association of users of optical scanning equipment.

Also elected were the following officers: Darol Alexander, Travelers Insurance Co., Hartford, Conn., vice-president; William W. Dwyer, Data Entry Systems, Inc., Morrisville, Pa., treasurer; and Robert Guida, Blue Cross of Massachusetts, Boston, secretary.

The association's winter conference will be held Jan. 12-14 at Mountain Shadows in Scottsdale, Ariz.

OCRUA is at 505 Busse Highway, Park Ridge, Ill. 60068.

Bank Saves Time, Too

As Paper Costs Climb, COM Savings More Significant

INDIANAPOLIS, Ind. – "Our decision to go to computer output microfilm (COM) encoded for fast retrieval . . . seemed to be a cost-effective measure that would bring us in step with current trends in the DP field.



This microfilmer unit transfers data from magnetic tape onto encoded 16mm microfilm.

"But as paper costs skyrocketed, our savings became much more significant," according to R. Michael Ahern, a DP officer with Merchants National Bank and Trust Co. here.

The bank, using COM-generated microfiche instead of conventional paper printouts, along with encoded rolls of microfilm, trimmed an estimated $70,000 in paper costs and saved 9,555 hours of computer time during the first six months of operation, Ahern said.

There are three primary uses for COM at Merchants Bank.

"All reports, except the daily exception reports, are produced on microfiche," Ahern explained. "Our biggest runs are in trial balances for different areas of our operations. For demand deposits, the report, printed on paper, amounted to 4,000 pages a day, stood two feet high and required 2-½ hours to print. The same information can be generated on microfiche in 25 minutes from the time the computer tape is loaded until the 17 microfiche masters are produced."

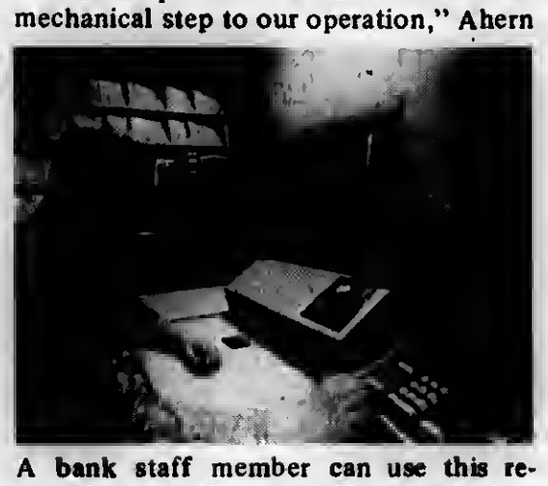
Merchants Bank's Kodak KOM-80 microfilmer uses a 42-to-1 reduction ratio to produce masters from which circulating duplicates are made. Original fiche remain in the data processing library.

"Our reports fall mostly into the very high-volume, very low-activity category," Ahern said. "Having them on microfiche is extremely important to us in terms of storage and production time. Many of our correspondent banks, for whom we do data processing, have very limited storage areas, which are normally inundated with stacks of paper printout. Now, they can have the same material in a usable form near the person who needs to use it."

Bottleneck Eliminated

A second application for COM is the creation of archival storage of documents such as demand deposit account statements. In the past, documents were filmed using a Recordak Rotoline microfilmer.

"The old procedure added an additional mechanical step to our operation," Ahern said. "Now, we've eliminated a clerical bottleneck and produced some labor savings."



A bank staff member can use this retrieval terminal to quickly access data stored on the encoded film magazines.

The third COM application involves use of an automatic key index system that eliminates manual searching for microfilmed records.

"Very few banks have their trust department accounting entirely on microfilm," said Gary Kyle, trust department assistant operations officer at Merchants Bank.

10-Second Retrievals

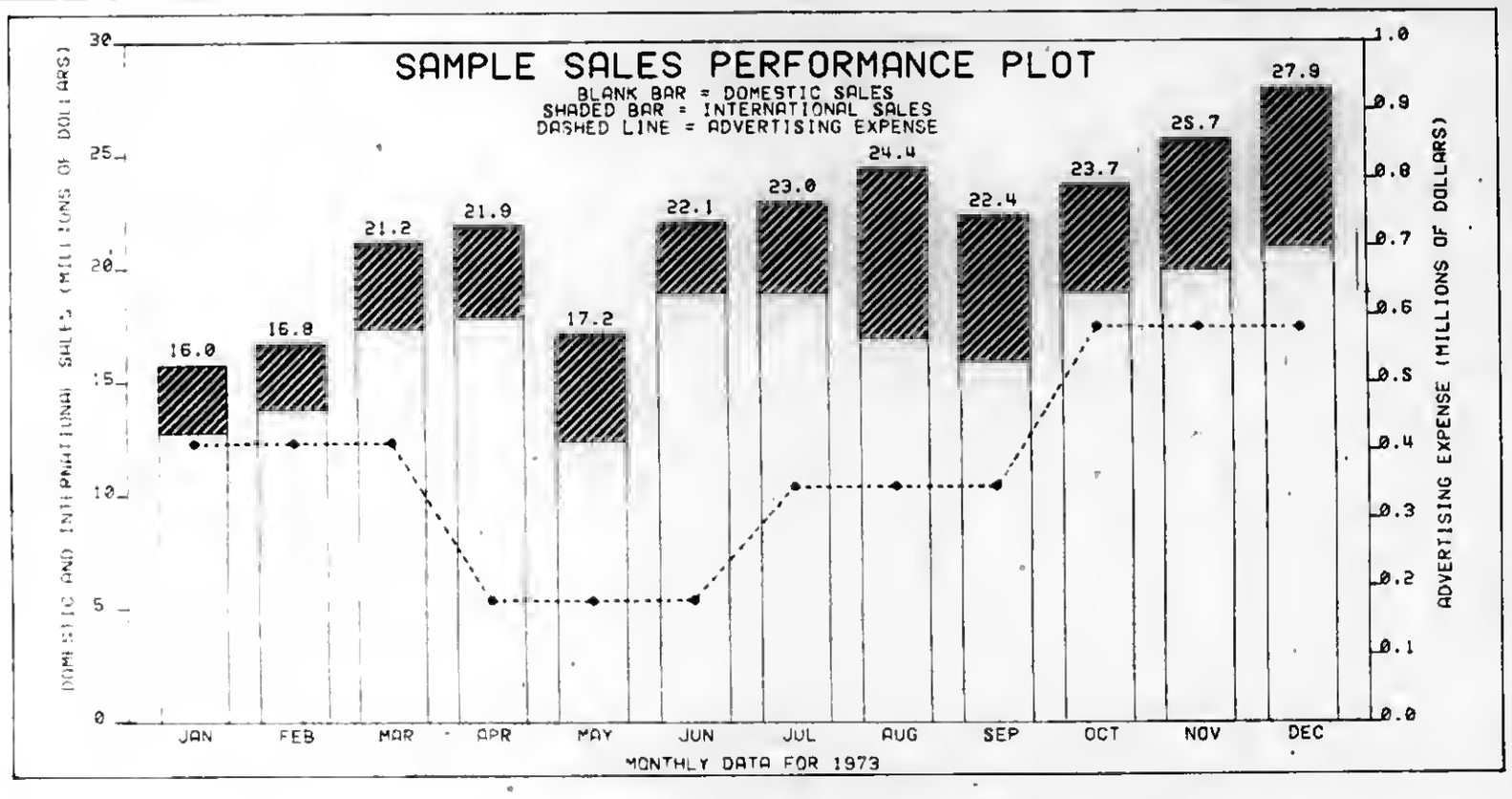
Efforts to automate accounting began with on-line data entry direct from the trust department to the bank's IBM computer. From there, output goes to the microfilmer which produces microfilm encoded for high-speed retrieval. With all the account information stored in plastic magazines containing encoded film, retrieving reports takes as little as 10 seconds, he added.

"We looked at a number of different data-entry methods," Kyle said, "including key punch, magnetic tape, optical character recognition, and on-line CRTs. We decided that, based on cost and time factors, on-line data entry would be faster and less expensive.

"From there, our problem was what to do with the computer output. We started with paper, but soon found storage was extremely difficult. We'd already been putting our old records on microfilm, so we looked at what COM could do for us," he explained.

Studies showed that COM-generated microfilm, in combination with Kodak Miracode II retrieval terminals, was a good method for retrieving the bank's

(Continued on Page 25)



One plot is worth thirty pages of printout.

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Selling a 370/155? Order a DAT Box

ENGLEWOOD CLIFFS, N.J. – Users who are considering selling or subleasing their installed IBM 370/155s should place a Dynamic Address Translation (DAT) Box on order as soon as possible, according to the recommendation of IPS Computer Marketing Corp.

The DAT Box permits use of the 155 as a virtual machine, and most buyers in this price range are interested only in virtual machines, the used equipment firm said.

Fire Prevention Guards Against Costly DP Downtime

By Mervyn Gould
Special to Computerworld

Computer downtime is a concern that arises in memos and late-night worries about the cost/productivity ratio. Yet one source of potential downtime is seldom discussed – what happens when a fire disrupts DP operations.

On the surface, there's good reason for focusing on the more routine problems. Certainly the computer and tape storage room don't look like fire hazards.

Yet appearances in this case are deceiving, for the labyrinth of wires and electrical connections essential to DP operations can constitute a potential hazard. At stake, at best, are hours of downtime, disruption of normal procedures and costly rehabilitation of the premises.

Far worse, however, is the resulting impairment of customer accounts, inventory records and analytical and sales data that can occur when reels of tape are destroyed.

What makes the DP area particularly vulnerable to fires is that personnel may not even know one has started until major damage has occurred. This can happen because DP power sources are largely hidden from view.

What User Can Do

What can the user do to protect his DP center?

First, educate all personnel to potential hazards. This instruction may include "good housekeeping," checking all equipment at the end of the shift, taking responsibility for closing doors to the tape storage area, learning to use fire extinguishers and determining evacuation procedures.

Get to know the fire hazards of the computer area. Fires may start right in the computer. Boards, liners, insulation and plastic harnesses are all combustible. Or fire may start in the computer service cables running under a raised floor, out of sight.

Inspect these areas periodically, as fire-inviting waste material and dust often accumulate here. When a blaze does occur in these concealed and confined areas, heat develops rapidly, igniting even fire-retardant insulation.

Fire may also start in motor-driven fans, filters, air conditioners, mechanical and hydraulic controls, overheated incandescent lamps, fluorescent lamp ballasts and other electrical equipment. No malfunction in any of this equipment should be ignored.

A survey of the facility by insurance underwriters and by experienced protection engineers is also advisable.

One of the most effective means of avoiding downtime and damage is an engineered extinguishing system which detects fire in the first crucial seconds and automatically delivers a knockout punch before the fire can cause a major calamity.

For example, a large financial institution protects its 26,000-square-foot DP area with a Halon 1301 "total flooding" system.

Upon sensing particles of combustion, ceiling and underfloor smoke detectors transmit a signal to a bank of steel cylinders where Halon 1301 is stored under pressure. At the same time, an alarm sounds warning personnel to leave the protected area.

After a few seconds delay, which permits clearing the area, the cylinders are discharged.

When released, the stored pressure acts as a propellant and directs the Halon 1301 gas through piping to discharge nozzles located in the hazard areas. The Halon then builds up an inert atmosphere in the immediately surrounding area and extinguishes the fire.

The Halon 1301 does no damage to either the electrical wiring or the equipment. Because the gas has no "wetting effect" on insulation and is not a solvent, no dry-out period is required, nor is there any corrosive effect. A heavier-than-air gas, Halon 1301 flows around obstacles, saturating the entire protected area. After its work is done, it disappears.

The important points, again, are to employ the full extent of preventive measures and then install a fire-protection system that will work for you automatically in time of need.

Gould is product group manager of fire protection systems at Walter Kidde & Co., Inc.

COM Savings Increase As Paper Costs Climb

(Continued from Page 24)

accounting records that required daily reference, Kyle said. The encoded microfilm saves space, reduces costs, is retrieved faster and serves as a complete backup for all information on file.

Of the 3,800 trust accounts at Merchants Bank, about 2,700 are considered active. Seventy persons at the bank review accounts daily, averaging 110 references a day. The checking of accounts, which formerly required up to 15 minutes, now takes just a fraction of that time.

Merchants Bank's microfilmer generates microfilm for the department's account cash ledger, account security ledger, account control ledger and the security control ledger. Some reports are produced daily; others, monthly.

All ledgers are referenced by a 10-digit number. Either the account number assigned to each account or a number assigned to assets such as stock certificates and bonds may be used.

In addition to "20 to 25 times faster" retrieval, file security is more complete, Kyle said. "Paper files can get lost or misplaced," he noted. "The microfilm magazines stay in a cart by the retrieval terminal and can be wheeled into a fireproof vault."

There are four sets of film files in separate magazines – one for each of the ledgers. The magazines are labeled with beginning and ending numbers of the accounts in each and by the type of report contained. Duplicate records are kept so that a given security can be referenced by account number or under the 10-digit code for that security.

All records not stored in magazines are kept on microfiche. No paper records are in the trust department, except for the copies printed for immediate use.

The trust accounting method at Merchants Bank has generated so much interest that the bank is marketing the technique through R. Shriver Associates of Parsippany, N.J.

From Source to CPU

A special supplement on Source Data Entry - In the October 29th issue of Computerworld.

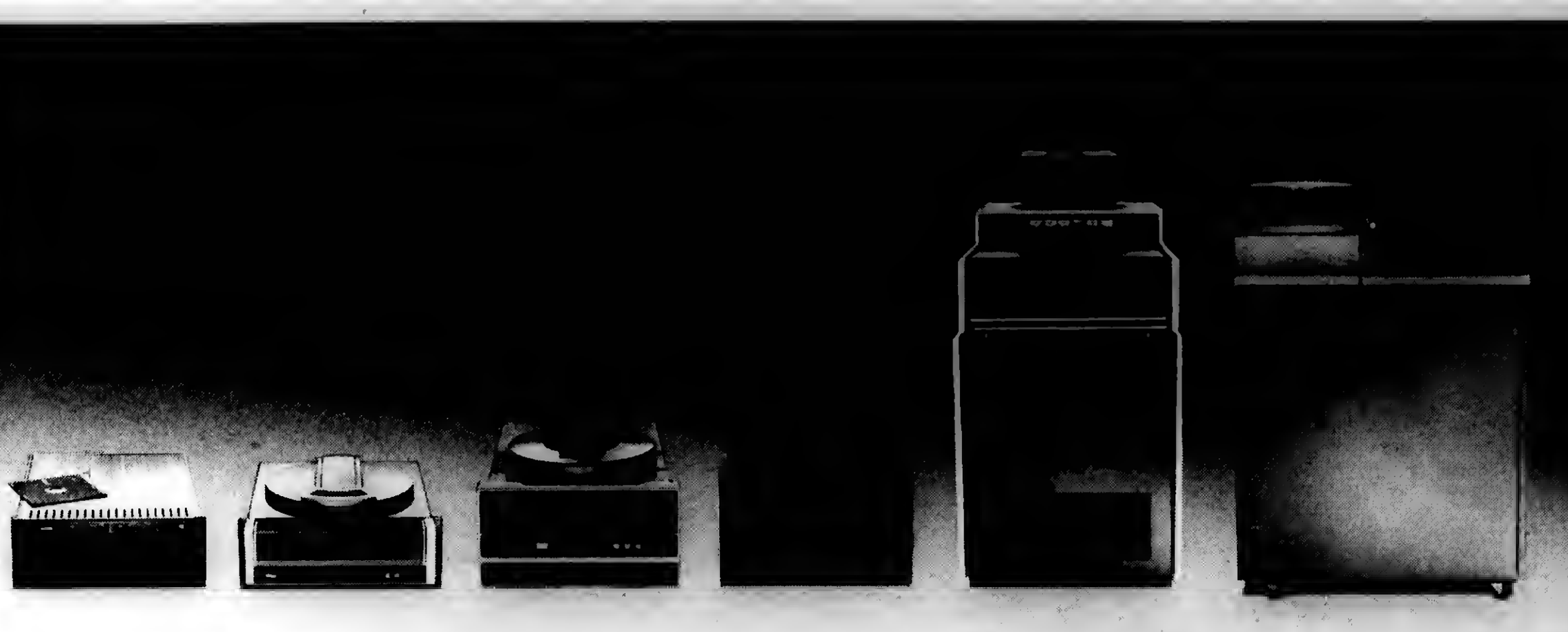
What used to be the exclusive domain of the keypunch operation has become the object of a confusing mass of systems, varying from card punch to OCR to distributed data entry and new, hybrid systems. This special supplement, edited by Vic Farmer, will analyze the many data entry applications in use today. Special emphasis will be given to capturing data at the source. It's projected to be the biggest CW supplement of the year, and it will be filled with applications stories, tutorials and viewpoints from users and experts on data entry. You'll see articles on subjects like these:

- Key-to-disk and key-to-tape
- The effective use of turn-around documents
- On-line data entry
- Terminal systems
- Distributed data entry
- Customized turnkey systems
- Optical Character Recognition systems
- New "Hybrid" systems · combinations like OCR and keypunch

If you're involved in the data entry process at your organization you should key in to this special supplement in the October 29th issue of *Computerworld*. And if you're a marketer of data entry products or services, your ad should be there. Don't miss the October 10th ad closing date. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Miniworld Products

Single-Board Disk Controller Fits Different Disks to Novas

ANAHEIM, Calif. – A single-board controller from Western Peripherals Corp. (WPC) accommodates both multiple single-platter drives and cartridge-type single- or multi-platter drives for use with Data General Corp.-type computers.

The WPC DC-220 universal disk controller is said to be completely software-compatible with all Data General Nova and Eclipse series computers, as well as Digital Computer Controls DCC-116 and Keronix, Inc. minicomputers.

Plugged into a single slot inside the computer, the DC-220 controls drive units or cartridge drives. The DC-220 controls as many as four single-platter cartridge drives, two dual-platter drives, two single-platter drives with 406 tracks per surface or a single dual-platter drive with 406 tracks per surface, the firm said.

The computer sees multidisk platters as though they were from separate drives. Automatic seeking of the desired track is performed by simply issuing a DOA command, the firm said. Address verification formatting is standard as a validity check on drive seeking. Every sector has its own address verification which allows data to be processed without having to wait for the disk to rotate past the index point.

With cartridge drives, data on the cartridge surface is media-compatible with the Data General cartridge. Disk rotation is selectable 1,500 or 2,400 rev/min.

Complete disk memory systems are available. Designated DS-220, these systems consist of the DC-220 Disk controller installed in the computer (supplied by the user) and a specified disk drive or drives which may be ordered from WPC.

Price of the DC-220 universal disk controller is $2,500. The firm is at 2893 E. La Palma Ave., 92806.

Memory Serves PDP-9, PDP-15

LAKE SUCCESS, N.Y. – High-speed, plug-compatible semiconductor memory from Dimensional Systems, Inc. (DSI) is now available for Digital Equipment Corp.'s PDP-9 and PDP-15 computers.

These memory systems feature a cycle time of 450 nsec; twice as fast as the equivalent core memory, the firm said.

The semiconductor memory is also twice as compact as core; 128K of memory and interface requires only 10-1/2 in. of panel space.

Memory is supplied in 4K by 18 bit increments with 32K by 18 bits on each plug-in board. Memory chips as well as logic integrated circuits are mounted in plug-in sockets for field replacement. The semimemory is of the static type so power failure data retention circuitry can be a very low-power-consumption battery power supply.

A typical 16K by 18 bit system is priced at $7,700. The firm is at 6 Nevada Drive, 11040.

Harris Offers 64K PDP-11 Add-On

FORT LAUDERDALE, Fla. – Harris Computer Systems has introduced an add-on core memory system for the Digital Equipment Corp. PDP-11 that is field expandable from 16K words to 64K words.

Called the Harris 3811, the system has a 650-nsec cycle time and contains features such as parity generate and check, a fail-soft circuit and memory protect. The system is Unibus-compatible and presents one Unibus load.

The Harris 3811 contains a dedicated power supply and timing control board. The uni is expandable from 16K to 64K in 16K increments and is available in a 16-bit configuration or an 18-bit configuration for parity systems.

The 3811 is priced at $9,000 for a full 64K configuration.

The firm is at 1200 Gateway Drive, 33309.

'Mini' Association Launched

FORT LEE, N.J. – After nearly two years in the planning, the Minicomputer Industry National Interchange (Mini) has been chartered as a nonprofit association.

Mini is a professional association which said it will concern itself with all areas of minicomputer systems, equipment, software and techniques. It is structured to accept individual members, corporate user members and manufacturer members.

The goals of the organization are said to be to:

- Provide a forum where new ideas, concepts, equipment and techniques and other appropriate matters can be examined and discussed by knowledgeable and interested professionals and where these persons can establish criteria for communication within their field.
- Provide a mechanism for the exchange and interchange of minicomputer experiences.
- Provide a central source where actual and potential minicomputer users and other interested parties can turn for information and assistance.
- Establish a meaningful dialogue between manufacturers and users.

Although Mini plans to eventually support special interest subgroups dedicated to all areas of interest to its membership, the initial subgroups will cover minicomputer architecture, operating systems and languages, business DP and telecommunications.

To aid in the distribution of minicomputer information, a formal requirement of each chapter will be to provide a free and open tutorial at about every other regular meeting. To further advance the minicomputer industry, the association plans special committees to coordinate with applicable sections of their professional and trade organizations and the trade media.

Initial sponsors of the group, required for its incorporation, represent several minicomputer manufacturers, corporate users and systems houses. The group has as its president pro-tem Jon David, head of Systems RDI Corp. and founder and former chairman of the Association for Computing Machinery's Special Interest Committee on Minicomputers. Pro-tem vice-president is Steve Mandell, associate director of the ADP Management Training Center of the U.S. Civil Service Commission in Washington, D.C.

Mini headquarters has been established at 2460 Lemoine Ave., 07024.

Off-Line, On-Line System Handles College's DP Services Economically

TIFFIN, Ohio – Heidelberg College is finding that a minicomputer can economically provide the full range of research, educational and college administration services required for its entire campus – often simultaneously.

While one student designs the lighting for a stage production, communicating with the computer through a display terminal, a faculty member may be running a government-sponsored study of river pollution, requiring hookup to a remote larger computer for special application programming.

At the same time, the college's treasurer may be on-line to the processor in connection with the campus payroll, while another professor may be processing data in a batch-processing mode.

According to Dr. John J. Jackobs, computer center director, the Heidelberg College computer facility here not only provides the gamut of DP services, it offers the students an open-shop environment that permits them to gain valuable hands-on experience.

"In the open shop, the students perform all the tasks necessary for getting their jobs done. They operate the machine itself, push the buttons and get a much better feel for the computer than by giving their punched cards to a secretary and getting the output back through the campus mail, as so often is the case on the larger campuses that have large insulated computer centers," said Jackobs.

Computer education here is treated as an adjunct to the other disciplines taught at this liberal arts school. After taking the first course in Fortran – the main programming language used with the 32K Varian Data Machines V72 computer – and an advanced course in programming, students then apply the computer technology to any special projects in which they are engaged.

Designs Lighting

A theater arts student, for example, is developing a program that will enable him to interactively design the lighting for theatrical productions using a CRT terminal. He hopes to use the computer to save many hours of work in setting and resetting the intensity and locations of the lights by having the computer help.

The program is also expected to ensure the capacity of the electrical circuits is not exceeded.

River Study

Faculty research now under way includes a river study conducted by the biology department and sponsored by the Environmental Protection Agency.

The computer produces plots of river load concentrations vs. distance downstream or time. Eleven students are assisting on this project, while educationally benefiting from the experience.

Meanwhile, the college's treasurer is using on-line terminals located in his office to perform general ledger, student accounts, accounts payable, check writing and payroll functions. The treasurer's office communicates directly with the computer and is thus fully responsible for its own data inputs.

Dedicated Unit Simplifies Constant Price Changing

WASHINGTON, D.C. – With prices changing almost as fast as faces in a Hollywood marriage, one Washington, D.C. area firm has found the ideal solution for coping with rapidly changing government requirements: the minicomputer.

Rexford A. Davis, president of Chesapeake Petroleum and Supply Co., Inc., distributors for Quaker State Motor Oil said, "We have an unusual pricing situation because we do business with the Capitol Area Support Center that does the local buying for military installations. But the pricing structure is determined by the government and Quaker State.

"Nearly every month we get a new price list with thousands of changes. And we must know how much of each item we have in inventory – and at what price."

About seven months ago, the firm installed a Basic/Four Corp. minicomputer in order to have instantaneous information. When the new lists arrive, the changes are made as fast as they can be typed into the computer.

Twice as Efficient

"The new equipment is twice as efficient as the ledger cards we were using. When a change was required before, it meant switching the information on the magnetic stripe on each card. There's no question it was a more time-consuming, bulky and less efficient method.

"The old approach involved locating each ledger card, pulling it out, putting it into the machine, making the necessary changes, putting it back into the file in its proper place and then finding the next one," he explained. "If you want to make a price change on ten items, for example, the present system can do it in less than a minute."

The Basic/Four system handles the company's total invoice function involving 10,000 numbers. The equipment produces product inventory, trial balances, comprehensive sales analysis, commissions, accounts receivable, cash receipt journals, daily sales reports and individual customer analysis. Accounts payable will be programmed next.

"There are many advantages to using a minicomputer," Davis noted. "We've been able to reduce our inventory on hand by more than half. And we are able to expand our sales without adding more people to handle the accounting function. In fact, it has released our present staff to do more important tasks. Moreover, the downtime on the minicomputer has been negligible."

Learning of Handicapped Studied

MANCHESTER, England – A minicomputer is being used by one of the research teams at the Hester Adrian Research Center here to assist in investigating the learning abilities of mentally handicapped children.

The long-term aim of the research is to provide teachers of such children with information which will enable them to develop their pupil's abilities more fully.

The research team using the Data General Nova 1220 is investigating some of the ways in which mentally handicapped people learn. The computer is installed in a mobile caravan, which also contains a small laboratory area.

The laboratory area contains a small, TV-like screen on which pictures or symbols can be displayed and a lever and hatch similar to those on a chewing-gum machine. These can be made to distribute sweets or small toys as "payment" for the child's recognition of a particular symbol displayed.

Pulling the lever on the wrong stimulus causes either a buzzer to sound – or no reward to appear. By varying the number of symbols, the number of times the lever must be pressed to obtain the reward and other factors, the complexity of the experiment can be increased and an assessment made of the child's sensitivity to rewarding or nonrewarding events.

The apparatus is connected on-line to the mini, which is equipped with a high-speed paper tape reader for reading in programs and a high-speed punch which records the results of the experiment as they occur.

These results are also recorded graphically by a pen recorder, providing an immediate guide to the results of the experiment, while the paper tape preserves the data in a form suitable for subsequent analysis.

The Nova is programmed in ACT-N, a specialized language designed for use by psychologists. Using this, the parameters of an experiment can easily be established and altered, even while the experiment is in progress.

Mini Handles College's DP

(Continued from Page 27)

This had reduced the workload for the computer center which employs one faculty member and four students.

The alumni office of the college is now gearing up to use the system through a terminal located in its office. The alumni office will keep files on alumni as part of its fund-raising and alumni-relations functions.

Can Connect With 360

Should powerful, large-scale, special application programs be needed, the system has the capability to connect in seconds over a dial-up telephone line, with an IBM 360 at nearby Bowling Green University.

This connection is made possible by virtue of that computer's Hasp operating system.

Connecting with the Bowling Green computer, in a remote job entry (RJE) mode, permits Heidelberg's faculty, students and administration to utilize such programs as the Statistical Package for Social Sciences and the General Purpose Simulation Studies when needed.

The minicomputer is capable of connecting, in this same way, with virtually hundreds of large computers around the country. The Bowling Green computer is only 45 miles away and, thus, the long-distance telephone call required is minimal in cost.

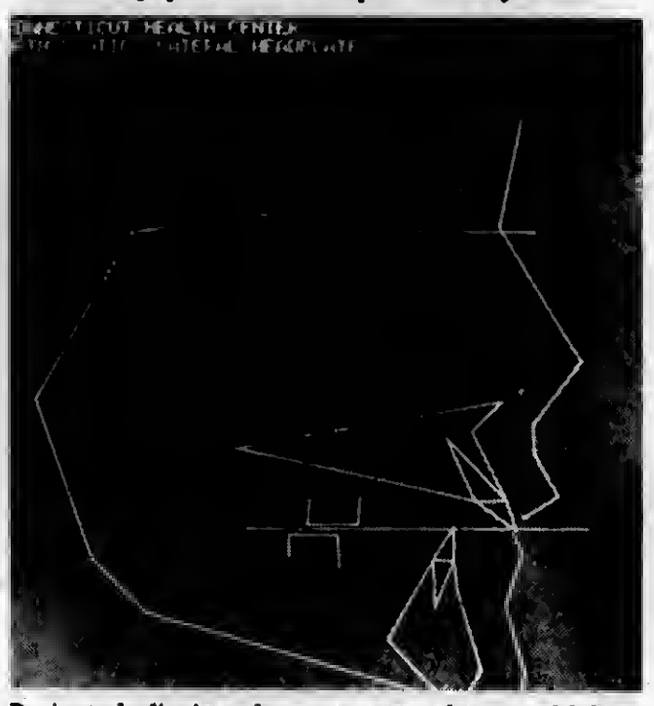
According to Jackobs, compared with the predecessor IBM 1130 computer system, the Varian computer is about four times faster in handling the average administrative task; has 10 times the capability in terms of storage, print speed and disk transfer specd; and can process five times as many jobs in the same time.

The advantage in throughput is due to the multiprogramming capability of the mini computer. This feature, controlled by the CPU's real-time operating system, Vortex, allows the computer to perform on-line and batch-processing functions while simultaneously linking up for RJE with other computers. The 1130 had to stop other tasks when operating in an RJE mode to Bowling Green.

The computer system here also includes a 300 card/min reader, 300 line/min printer, 14.5M-word disk, CRT input console, remote printer, magnetic tape drive (800 bit/in.), incremental plotter and a 16-channel data communications multiplexer with eight lines capacity.



Various points on the X-ray of the mouth are traced on paper and then input to the system.



Projected display demonstrates what would happen as the orthodontist tries different methods to correct a dental problem.

Graphics Approach Aids Orthodontists

FARMINGTON, Conn. – Staff members here at the University of Connecticut School of Dental Medicine have developed an interactive graphic approach to offer the orthodontist a CRT presentation of the potential changes in growth patterns as braces, arches, wires and other orthodontic appliances are administered.

Based on this data, the best treatment plan for the patient can be determined. The output also helps in designing the proper appliance to be used.

The tablet saves time by eliminating the need for keyboard entry of numerical X-Y position values. Additional cost reductions are achieved by eliminating manual orthodontic calculations.

On stylus press-down, X-Y coordinates values are presented to the computer. These points are connected and displayed as an outline of the face and teeth.

In operation, the first step is to take the necessary x-rays and measurements of the patient's head. Tracing paper is placed over the X-ray and key points noted. The tracing is then positioned on the Summagraphics data tablet, illuminated and the key points digitized with the stylus.

The system software analyzes the data and scales it, and a resultant diagrammatic sketch of the patient's face and teeth is displayed on the CRT.

Using the stylus, the operator draws in, on the tablet, dental appliances to be added to the teeth. These sketches and their effect are immediately displayed.

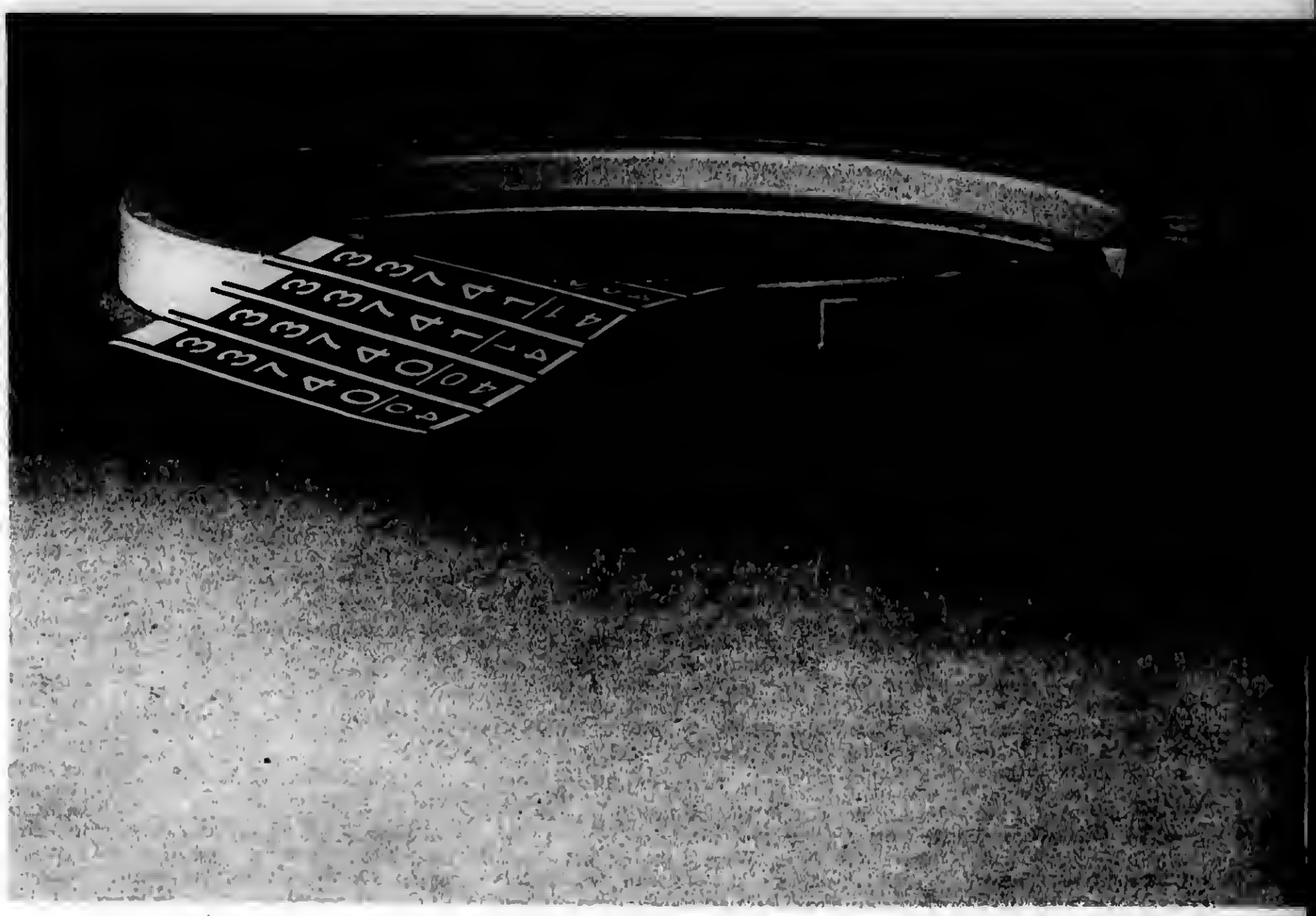
Panafacom 16-Bit Micro on Display

SAN FRANCISCO – Japan's Panafacom Ltd. is demonstrating its recently announced 16-bit microcomputer system at the Wescon Conference here this week.

Designated the PFL-16A, the system combines essential features found in minicomputers with the price/performance characteristics of microcomputers, the vendor said.

Engineers have implemented all key microcomputer functions on three proprietary chips. The design configuration includes one chip for the CPU and two chips to support a highly efficient I/O structure, a spokesman explained.

Deliveries of the PFL-16A are scheduled for December. Sample chips will be available in October, when prices will be announced.



At South Pole, of All Places

Mini Stays Cool Aiding Study of Heat Circulation Trends

DAVIS, Calif. – At probably the world's cleanest, coldest and most uniformly desolate spot, only yards from the bottom of the planet Earth, in Antarctica, scientists have set up shop to study – of all things – air pollution and heat circulation trends.

To do this, 35 crates containing the dismantled parts of two identical minicomputers plus spare parts were shipped 9,000 miles from the University of California campus here at Davis.

The dismantling was necessary to facilitate handling at the South Pole and to permit the minis to pass through a narrow passageway in the recently refurbished Amundsen-Scott station.

Before the use of these computer systems, experimenters had to lug reams of collected data back to the U.S., not knowing when they left Antarctica whether the data was, in fact, good data. Now, the on-line system produces outputs in real time, allowing researchers to study the results during the experiments.

Flow of Heat

In one experiment scientists are studying the flow of heat energy into and out of the polar cap. According to Dr. John J. Carroll, the vast difference between equatorial and polar temperatures is the main reason for the mass movements of air within the atmosphere.

By knowing the temperature changes at the pole, scientists will be better equipped to make long-range predictions of atmospheric circulation and global weather trends, he said.

The station's primary computer logs data on magnetic tapes and processes it preliminarily. The system consists of a Hewlett-Packard HP 2100S microprocessor, a video display, keyboard console, a line printer and other electronic equipment which interface and condition the signals arriving from the outside experiments.

A second experiment, led by Dr. Kinsell L. Coulson, has as its basic premise the fact that the South Pole is one of the world's cleanest places, free of local pollution.

By periodically measuring pollution levels here, researchers believe they will have a more concrete idea of whether the global situation is worsening and how fast.

The primary computer system at the station is backed up by an identical HP system, which stands ready to go on-line should a malfunction develop in the first system.

Ordinarily the backup computer is used off-line, unburdening the on-line system by performing further data reduction, by separating data collected on tape of various experiments and by performing program development.

A third backup unit consisting of another 2100 processor with 8K memory, CRT console and magnetic tape drive provides an additional source of spare parts.

At the University of California at Davis, the fourth system, identical to the primary South Pole system, is used to train experimenters who will be setting up research at the pole. It also permits the experimenter to check out the compatibility of his experiment with the processing system in terms of both hardware and software.

In addition, the Davis system allows for remote debugging of its twin at the pole. Solutions to hardware or software problems that might develop can be simulated at Davis and communicated to the pole by radio.

Fixed-Base Aviator Likes System's Man-Hour Savings

BEDFORD, Mass. – A small computer system designed for administrative operations at a general aviation fixed-base operation (FBO) has already paid for itself in terms of saved man-hours.

The system, built around a Digital Equipment Corp. PDP-8/M minicomputer, saves personnel of Tech Aeroservice, Inc. an average of 160 man-hours per week while increasing dispatcher effectiveness.

In addition to providing the status of the facility's aircraft instantly to the dispatcher upon demand, the system keeps inventories, sales, charges and receipts, payroll information, accounts payable and receivable and changes in Federal Aviation Regulations up to date. It even informs Tech's customers automatically when they are due for a medical examination.

The brainchild of William E. Ziminsky, president of Tech, the system is small enough to fit into the main operations room without dominating it. Noting that a dispatcher's job, while necessary, was both difficult and thankless, Ziminsky said, "When you are running an FBO where several dispatchers may have to take care of a large number of pilots, it's easy to lose control. And you can't afford to do that."

Tailored to FBO

Ziminsky determined a computer would be required to ease the paperwork of his dispatchers. Instead of a conventional business system, however, he directed the development of the system so it would be tailored to problems unique to the FBO.

"The computer system can determine instantly what the status of an aircraft is and whether the pilot who is requesting it has been checked out in it," he said.

The system, which includes magnetic storage disks and a printer terminal as well as the minicomputer, it capable of handling 2,000 accounts. The terminal automatically prints out the flight record sheet with the information needed to determine rental fees – meter readings similar to the mileage readings recorded when a rental car is checked out – further streamlining procedures and helping to eliminate potential mistakes.

One result of the system is the safety it affords. "We put in all sorts of guards," Ziminsky noted.

For example, if a student pilot hasn't had a dual-instruction flight within 30 days, he can't check out a plane. "The number of days is arbitrary, but having the records on computer helps us avoid slipups."

The computer also informs the dispatcher of the recording hour meters for every aircraft and includes special callouts for aircraft with less than 20 hours.

Ziminsky believes his system is the first designed expressly for FBOs and feels that, in the future, most FBOs will employ equivalent systems because of the increased safety, efficiency and control they afford.

Calif. Engineers' HP 3000 'Gives a Dam'

RIVERSIDE, Calif. – Engineers at the Riverside County Flood Control and Water Conservation District's headquarters here are using a small system to study hydraulic and hydrological problems and to design such flood-control structures as dams, channels, storm drains and levees.

The minicomputer, installed about a year ago, is the central element in a computing system used by the district's engineering staff working through CRT terminals. Most of the system's software was developed by the district. About half of the engineering jobs handled by the Hewlett-Packard HP 3000 originate from terminals; the rest are entered from cards. Eventually, about 80% of the system's work load will pass through the terminals.

The Riverside County Flood Control and Water Conservation District was established in 1945 to control flood and storm waters, prevent flood damage and import water from other parts of California. With an annual budget of $28 million, its jurisdiction embraces 2,736 square miles.

To support the construction, operation and maintenance of this system, the district's engineers perform a variety of computer-aided studies. These include:

- Structural studies to optimize the design of dams, bridges, channels and underground storm drains. Here the HP 3000 determines the stresses borne by bridge members, buried pipes or storm drains under predicted loads.
- Earthwork studies, to determine the volume of earth that must be moved in excavating a channel or building a dam. Here a graphical approach may be used; the computer receives graphical representations of the applicable terrain and of the structure to be built.

The district's system includes six CRT terminals, a line printer, a card reader and a disk drive.



College Trains High School Students as DP Technicians

LOS ANGELES – While the age of computer technology has arrived, the age of computer literacy is lagging far behind.

The general public is, for the most part, unaware of the scope and role of computers in our society. And the computer industry itself chronically suffers from a critical shortage of skilled, thoroughly trained hardware technicians with "hands on" experience on today's minicomputer systems.

Pierce College, a two-year school in California's Los Angeles Community College district, has instituted a training program for computer technicians to serve its students, its supporting community and industry.

The Pierce computer technology program is directed toward both high school graduates and current high school students looking toward careers in computer technology and toward teachers of mathematics, science and the liberal arts seeking a greater knowledge of computer science.

The three phases of the program are:

- To graduate competent computer technicians with an Associate in Science degree.
- To involve a greater number of high school students in computer technology training and to stimulate interest in and understanding of computers to most students.
- To assist high school teachers interested in computer technology through summer workshops.

The Pierce program extends computer training down to the secondary school level, as the computer department staff found that the average high school student – the child of the television era and the space age – doesn't have the slightest concept of how a computer works.

Yet they've discovered many students are suddenly "turned on" by the potential a career in computer technology offers. Several students failing in high school prior to enrolling in the precollege computer technology courses have made the dean's list after enrollment.

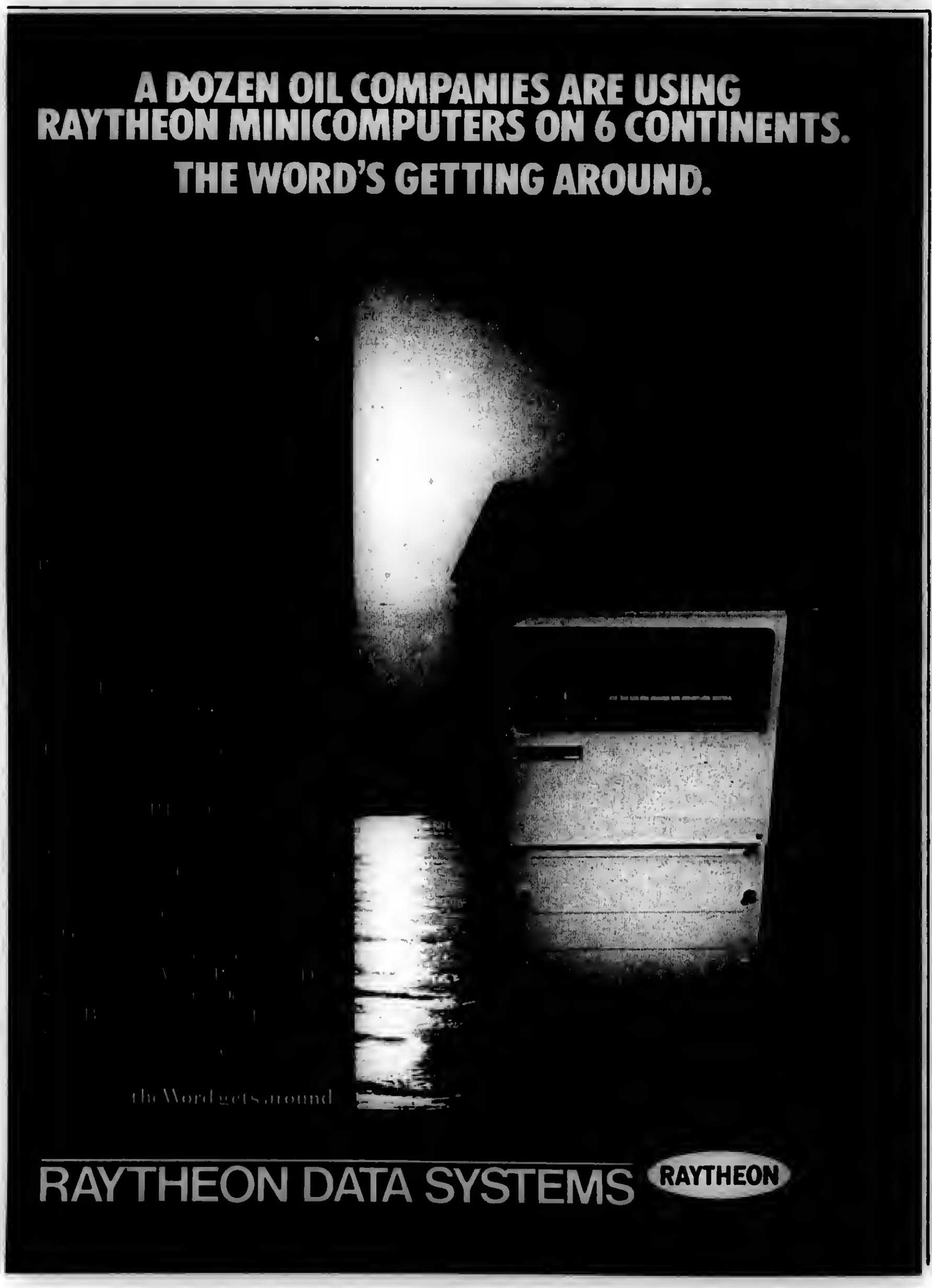
High school students who elect to enter the program can take up to one full semester's work at their own schools through the use of logic trainers – small units that teach the student how a computer logically performs its functions. Since the curriculum is the same as that taken by Pierce freshmen, full college credit is given.

Pierce was able to set up its computer technology program through two major grants; the first from IBM, the other from the National Science Foundation (NSF). The NSF funds enabled Pierce to upgrade its equipment and to obtain a Digital Equipment Corp PDP-11/40.

'Bugs' Added

Beside providing students with a thorough understanding of computer theory, the Pierce program offers intensive laboratory instruction where the student troubleshoots "bugs" inserted in the equipment to produce malfunction.

Pierce College's experience in the high schools indicates training in computer technology at the secondary school level can provide a desirable alternative for students who are not motivated by conventional academic subjects, but prefer to work with their hands.



ADC Offering Complete System On One Board

SANTA ANA, Calif. – A complete computer implemented on one 15-½ in. by 16 in. board is available from Applied Data Communications (ADC).

The heart of this general-purpose computer is an Intel Corp. 8080. Memory included in the basic system is 4K bytes of random-access memory (RAM) and 1K bytes of reprogrammable read-only memory (ROM).

Terminal communication is provided for teletypewriter, CRT or modem through an asynchronous I/O with speed select from 110 to 9,600 bit/sec. Peripheral communication is provided on two flat ribbon cables. Both direct memory access (DMA) and non-DMA device controllers are accommodated.

Also included is a floppy disk controller to interface up to eight drives, the firm said.

Optional peripherals and controllers offered with the system include front-panel console, IBM-Compatible floppy disk, 3M Co. tape cartridge, programmable real-time clock, line printer, character printer, 7-track or 9-track magnetic tape, synchronous/asynchronous communications, general-purpose I/O card and ROM programmer.

Price for the complete CPU card with 4K RAM and 1K programmable read-only memory (Prom) is $1,300. CPU card in chassis with power supply is $1,990; including front-panel console the price is $2,440. The system price of $4,600 includes CPU, front panel and one IBM-compatible floppy disk.

The firm is at 1509 E. McFadden Ave., 92705.

COMPUTER INDUSTRY

CI Notes

NCR Licenses Mitsubishi

DAYTON, Ohio – NCR Corp. has signed a royalty agreement with Mitsubishi Electric Corp. that gives Mitsubishi exclusive rights to manufacture 1K-bit and 4K-bit metal nitride oxide silicon (MNOS) P-channel memory devices in Japan.

Mitsubishi also gained nonexclusive worldwide marketing rights for the device.

The agreement excluded use of the technology for TV and radio tuning devices because NCR has licensed General Instrument Corp. for worldwide use of the technology in those fields.

NCR will receive initial payment plus royalties on Mitsubishi's sales of the electrically alterable read-only memory (Earom) devices developed by NCR's microelectronics division. NCR uses the devices in various terminals.

FTC to Collect Shipment Values

WASHINGTON, D.C. – The Federal Trade Commission (FTC) has approved a plan to collect information on the value of shipments by the country's 1,000 largest manufacturers.

The FTC will use the data yielded by the corporate patterns survey to look for possible antitrust violations, evaluate the impact of mergers and note changes in market structure. The FTC last ran such a survey in 1950, and plans to collect similar data in 1977 and 1978.

The effort is distinct from the FTC's push to collect data on profits of major corporations broken down by line of business, which has drawn opposition from several firms.

The FTC said it will not publish data from any individual company before Jan. 1, 1978.

Supershorts

Talks regarding a possible merger between Pertec Corp. and Computer Machinery Corp. (CMC) have been terminated, CMC said.

– – –

Intel Corp. has named Kanematsu Electronics Ltd. of Tokyo as its Japanese distributor for add-on memories for the IBM 370/135, 145 and 158.

– – –

Boeing Computer Services, Inc. will market A.O. Smith's manufacturing data system in 44 states.

– – –

Data Card Corp. has appointed Sistematic as Brazilian representative for printer systems made by its Troy Division.

In Data Entry/Communications

U.S. Base to Reach $12.7 Billion by '79

WALTHAM, Mass. – The number of data entry/communications units in the U.S. should grow at about 15% a year through 1979, bringing the total installed base to about 1.6 million units valued at $12.7 billion, according to a study from International Data Corp. (IDC).

At year-end 1974, the U.S. installed base of such equipment totaled about 840,500 units valued at $5.3 billion, the firm said. During 1974, about 160,800 units with a value of $1.2 billion were shipped.

The most explosive growth will be in the area of distributed or clustered processing systems and associated products, the study indicated.

IDC defined a clustered processing system as an intelligent operator-oriented terminal system with disk or diskette, a minicomputer or microcomputer and a telecommunications link to a central computer.

So far, the independents have gained the lion's share of the market, with IBM holding less than a 50% share of the number of installed systems in the combined data entry/communications market at year-end 1974.

Dividing up the growth by sectors, the figures in IDC's *EDP Industry Report* (EDP/IR) showed distributed keyboards should have a five-year growth factor of 250. The next highest growth rate cited was 7.5 for intelligent terminals; CRTs, both editing and conversational, showed 3.4 growth factor.

Keyboard/printers should grow at the rate of 1.2 and key-to-disk units at 1.3, EDP/IR said.

However, key-to-tape devices and keypunches will have a negative five-year growth factor of 7.7 and 1.4 respectively, IDC said.

Looking at the U.S. keyboard market in 1974, IBM held a 52% market share by number of keystations, with independents at 26%, other mainframers at 12% and AT&T at 10%, EDP/IR said.

Breaking out the 1974 revenues of independent manufacturers of keyboards, which totaled $700 million, the largest share, 32%, went to key-to-disk systems. Intelligent terminals followed at 19%, edging ahead of CRTs at 18%.

Key-to-tape units held 14% of revenues, and keypunches and conversational printers tied with 8.5% each.

NCR Ships Production Scanners As Stores Adapt to POS Systems

DAYTON, Ohio – As part of its plan for step-by-step implementation of supermarket point-of-sale (POS) systems, NCR Corp. has begun shipment of production-model Universal Product Code (UPC) scanning equipment.

The firm has shipped almost 1,000 computerized supermarket checkout systems, and production shipments of scanners represents the next step in NCR's strategy.

The strategy is based on the desires of the supermarket industry, the degree of implementation of the UPC code, and NCR's experience in installing its first scanning system, according to D.J. McCarthy, NCR vice-president of retail systems marketing.

The strategy consists of four elements, he explained. Among them are thorough testing of pilot scanning systems in live environments; installation of a broad base of computer-controlled supermarket systems without scanning modules and limited installation of production-model scanners over a wide geographic area.

In addition, the NCR plan includes full-scale marketing and installation of scan-

(Continued on Page 32)

FASB Drafts Lease Accounting

STAMFORD, Conn. – Standards for leveraged leases and increased disclosure by lessors are two of the elements contained in a recent draft on lease accounting issued by the Financial Accounting Standards Board (FASB).

The board also defined what constitutes a capital lease.

Under the FASB proposal, leveraged leases would be accounted for by the lessor under the "separate phases" method. This method recognizes the separate investment phases that are characteristic of these leases in which the lessor's net investment declines during the early years and rises during the later years.

Leveraged leases were defined as those in which the cost of the leased asset is largely financed through long-term debt that is nonrecourse to the lessor.

The draft may provide an answer to lessors wondering when they can qualify a lease as a sale. For a lessor to categorize a lease as a sales-type lease (if manufacturing or dealer profit is involved), the lease must satisfy a total of three criteria, the draft stipulated.

The probability of collection of lease payments must be "reasonably predictable" and there should be no important uncertainties surrounding the amount of costs still to be incurred by the lessor under the lease.

The third criteria needed by a lessor to capitalize a lease would be any one of the following five: if a lease transfers title to the property to the lessee by the end of the lease term; if the lease contains an option to purchase the property at a bargain price; or if the lease term is equal to 75% or more of the estimated economic life of the property.

(Continued on Page 32)

DP Exports Aid Trade Balance

WASHINGTON, D.C. – Computer shipments again helped the business machines category show a positive balance of trade in the first quarter.

U.S. exports of business machines totaled $670 million, while imports were $257 million, for a positive trade balance of $413 million in the quarter, according to figures from the Commerce Department.

Exports of computers and related equipment were valued at $555.5 million, or 83% of the business machines total. DP imports totaled $32.5 million.

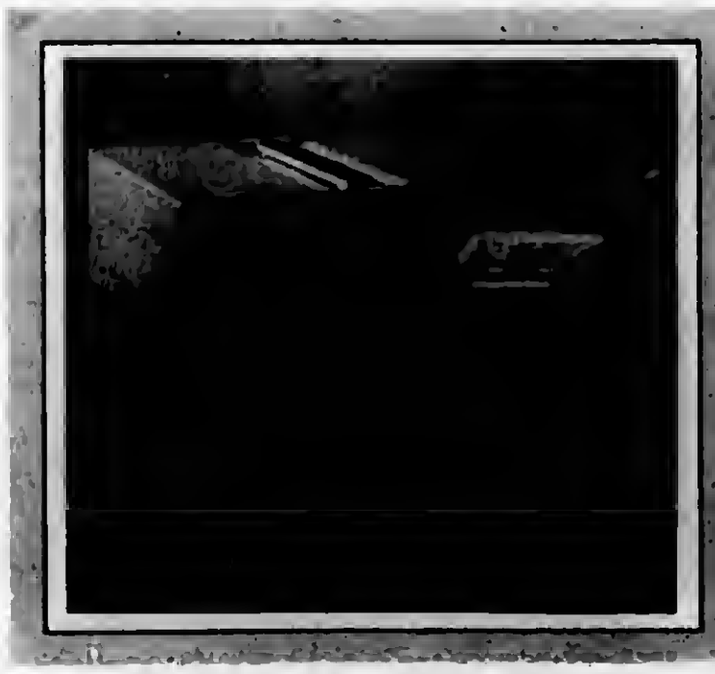
Although a Commerce spokeswoman cautioned that year-ago figures are not directly comparable because some items were reclassified, in the first quarter of 1974 the U.S. exported about $469.5 million of computers and related equipment.

On a comparable basis, the increase in DP exports over the year-ago quarter was about 9%, she said.

Breaking down the allocation of shipments, the UK was the largest customer, purchasing U.S. exports valued at $80.3 million. Canada followed with $78.5 million, ahead of France with $62.4 million. West Germany purchased $61.3 million and Japan bought $53.6 million.

The quarterly figures on imported computers represented an increase of about 25% over the 1974 quarter. However, parts were included in the export figures but excluded in the import figures, she said.

Imports of DP equipment included $15.1 million from the European community and $1.8 million from the Far East.



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Sales of 3000s Twice Those of Last Year, HP Reports

By Molly Upton
Of the CW Staff

CUPERTINO, Calif. – Sales of the HP 3000 system have doubled over those of last year, according to Ed McCracken, general manager of Hewlett-Packard Co.'s (HP) new General Systems Division, which handles the 3000 and the 2000 Access systems.

HP has started to mount a major marketing program to go after IBM System/3 users seeking upgrades, he said.

As part of its effort to pursue the business/commercial market for the 3000, HP offers seminars, primarily on data base management.

HP discovered many of the attendees at these seminars are from small installations seeking upgrades. The seminars are part of HP's "horizontal campaign to pick up business wherever we can," McCracken said.

Sales to System/3 users have increased dramatically in the last few months, he added.

Less than 25% of installed 3000s are in the educational arena, and even there the systems are used principally in commercial applications, he said. Cobol, RPG, data base management and Image data base management are on those systems, he explained.

In the education market, Fortran has declined dramatically as part of the total mix for HP within the last year, he said, while Cobol and RPG have risen.

"We have several markets we're looking at. The educational market is certainly one, and we're working with third-party software houses with educational administrative software that has been written around our data base management package."

The HP 2000 can be used either as a Hasp workstation or as a time-sharing system.

It has dual processors and is priced less than some single processor systems from other makers, McCracken said.

Within time-sharing, 70% of HP's sales are to the educational market, but the firm is expanding into the industrial field, he said.

New Structure

The new structure at HP, in which two new divisions were created out of the Data Systems Division, allows management to more closely focus on sepcific areas such as the 3000 and 2000, he said.

The move was in keeping with the HP tradition of small, decentralized profit centers, he said.

The two fastest growing areas, terminals and the 3000, were split off, and time-sharing was added to the 3000. The overall orientation is toward business systems compared with Data Systems, which targets the OEM and industrial areas with the 21MX and industrial units, he said.

HP has no interest in picking up Xerox's Data Systems Division, McCracken said, and the question of picking up part of the business has not been addressed.

NCR Now Shipping Production Scanners

(Continued from Page 31)

ners which can be retrofitted to the broad base of computer-controlled systems already installed as the UPC code becomes widely used.

One of the important findings in the Marsh supermarket test project, installed over a year ago, was the need for step-by-step implementation of computer-controlled checkouts, McCarthy said.

"The store found it advantageous to have time to adjust to the completely new system and the new internal procedures involved before converting to scanning" a year later, he said.

"For example, store personnel had to be trained in using the equipment, and new procedures for handling coupons and food stamps had to be implemented, as well as new balancing procedures.

"Most importantly, store management needed time to adopt a new way of looking at its operation. The system provides a whole range of new information which can be used to improve efficiency. Store personnel have to adjust to all these changes and shoppers need time to see how the electronic systems work before scanners are installed," he said.

"If this gradual implementation is followed, there are fewer chances for mistakes and the store can adjust to the new systems with little disruption of its normal business."

Recognizes Caution

The NCR strategy also recognizes the caution with which scanning is being approached by the industry, McCarthy said.

Until scanners are fully proven in a large number of stores and are totally accepted by shoppers, the supermarket industry prefers a gradual approach.

"Also, the degree to which the UPC is being implemented is an important factor," he said. "We estimate that between 50% and 60% of all packed dry-goods items and dairy products are now being marked with the code."

Most store operators believe over 80% of supermarket items must be source-marked by the manufacturer before scanners will become economically feasible, he said. This level of source marking is unlikely to be reached until late 1975 or early 1976, he added.

Gradual implementation of scanning also gives supermarkets an opportunity to test shopper reaction to the system.

"At each stage, stores can take surveys of shopper opinion as the changes are made," he said. "In addition, analysis of operating figures measures the impact of the systems on revenues and profits."

One of the important tasks in converting to computerized checkout, McCarthy said, is to gather a large base of information on the systems so stores can formulate policies.

FASB Drafts Proposal On Lease Accounting

(Continued from Page 31)

The other two requirements are if it is estimated that by the end of the lease the property's fair value will be less than 25% of what it was at the beginning or if the property is special-purpose to the lessee.

Lessees would be required to classify a lease as a capital lease (shown as an asset and an obligation on his balance sheet) if it meets any one of the preceding five criteria, the board said.

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Data Communications Course #1010 —Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

San Diego	**Plaza Int'l Hotel**	**Sept. 29-30**
New York	**St. Moritz**	**Oct. 13-14**
San Francisco	**Dunfey's Royal Coach**	**Oct. 20-21**
Dallas	**Hilton Inn**	**Nov. 10-11**
Miami	**Marriott Miami Beach**	**Nov. 17-18**

Data Communications Course #1020 —Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Miami	**Holiday Inn Airport Lakes**	**Dec. 1-3**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

New York	**Summit Hotel**	**Oct. 22-24**
San Francisco	**Hyatt Regency San Francisco**	**Nov. 12-14**
Chicago	**Hyatt Regency O'Hare**	**Nov. 19-21**

How to Draft Effective Legal Agreements

This one-day seminar is a complete workshop for non-legal, technical people who may be called upon to draft legal agreements for their company. Also led by Roy Freed, this seminar covers a variety of formal agreements, their structure and the legal factors involved. You'll have all the basic skills necessary to write legal agreements, and you'll be able to spot items that really require the attention of lawyers.

Cost for the seminar, including luncheon and a complete workbook on the subject, is $135.

New York	**St. Moritz**	**Oct. 8**
Boston	**Sheraton**	**Oct. 15**

Data Base Design

Given in association with Leo J. Cohen and Performance Development Corporation, this three-day seminar is a package-independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimum File Organization/Indexing Techniques, File Integration, and much more.

Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300.

New York	**St. Moritz**	**Sept. 22-24**
Denver	**Denver Hilton**	**Dec. 1-3**

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

New York	**Summit Hotel**	**Sept. 29-30**
Wash., D.C.	**Marriott at Wash. Int'l. Airport**	**Oct. 20-21**
Chicago	**Hyatt Regency O'Hare**	**Oct. 27-28**
San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

New York	**St. Moritz**	**Oct. 6-7**
San Francisco	**Berkeley Marriott**	**Nov. 10-11**

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Low End Expanding Quickly as French DP Sites Grow

By Molly Upton
Of the CW Staff

LONDON – Computer installations in France are growing at a rapid rate, with much of the expansion coming in the lower end of the market and in terminals, according to figures published by the Commission du Traitement de L'Information (Cotti) and reported in *EDP Europa Report* (EDP/ER).

As of Jan. 1, the number of computers installed in France had grown 27.7% to 14,195 compared with 11,117 installations a year ago, the report said.

The number of visual record computers installed increased 17.5% to 33,380 compared with 28,415 units in 1974, the report said.

Excluding a small section for "other" machines, the process control sector showed the highest rate of growth, 37.8%, and general-purpose systems rose 31.3%.

The number of processors intended only for scientific purposes declined 22% to 177, EDP/ER said.

In the processor area, Cotti figures showed systems with a value of under $57,500 numbered 3,924 compared with 2,758 a year ago.

The largest number of processors, almost half the installed base in France, fell in the range between $57,500 and $322,000. There were 6,466 of these systems installed at the beginning of 1975 compared with 5,596 at the start of 1974.

For systems worth between $322,000 and $1.6 million, the base totaled 2,038 units compared with 1,848 last year, the report said.

There were 624 systems valued between $1.6 million and $4.8 million compared with 546 a year ago, according to the report.

The total installed base rose to 13,052 systems compared with 10,748 last year. EDP/ER observed the last set of figures eliminated the largest and smallest systems and those classified as "other."

Terminals Growing Fast

Terminals was a fast-growing peripherals sector, growing from 17,019 units at the begining of 1974 to 27,163 by 1975.

The number of nonintelligent terminals grew 72.9% to 22,250 from 12,867 while intelligent units climbed 42.4% to 5,913 units from 4,152 units, EDP/ER said.

The use of card punches and single-station data entry units with a magnetic medium fell slightly, the report noted, and was compensated for by the increased use of terminals and a 50% growth in the number of key-to-disk systems installed.

Card punches declined to 49,268 from 52,395 units, and multistation key-to-disk units totaled 961, the report said.

Line printers grew to 17,131 units from the 13,159 units reported on Jan. 1, 1974. Tape cassette units nearly tripled, jumping from 552 to 1,520 units, EDP/ER said.

Fixed-disk drives increased to 1,548 from 1,224 while exchangeable disk drives rose to 15,697 units from 12,881 at the beginning of 1974, the report said.

By application market, management was the largest category with 3,675 systems, up from 3,096 a year ago, while scientific declined to 173 from 223.

Industrial systems grew to 1,852 compared with 1,343, while systems used in "universal" applications grew to 7,352 from 6,086 last year, the report said.

Braegen Seeks Funds After Calcomp Jilting

SUNNYVALE, Calif. – Braegen Corp. is talking with other sources of possible funding after it was left waiting at the altar when California Computer Corp. (Calcomp) decided not to acquire it [CW, Aug. 27].

The firm, which has shipped about 19 systems, each including a processor and an average of 10 terminals and associated peripherals, is talking with people regarding refinancing, an officer said.

The financing could be equity, but not necessarily, he said.

Braegen is still in production, he added. The firm remained in its facilities here during its courtship with Calcomp.

A spokesman for Calcomp said it had decided to put its funds into other product areas where there was a more immediate return on investment. He estimated the Braegen enterprise would need two more years to become profitable.

There was no problem obtaining orders for the Braegen product, he added, but there was a question of profitability.

Philips Plans Competition For IBM System/32 Arena

PARIS – Philips has announced plans to manufacture a floppy disk office system in direct competition with IBM's System/32.

The product, designated the P362, will also be competing with Logabax's recently announced LX4500.

The P362 will be built around a P350 computer. The peripherals will include a disk and cassette.

Philips' floppy disk will have a smaller storage capacity than the System/32, according to *Zero Un Informatique*, but nevertheless will be a serious competitor in the field.

Neither a price nor a production date have yet been announced.

Consulting Firm Formed

LOS ANGELES – A management consulting firm, J.K. Sweeney & Co., Inc., with offices here and in Versailles, France, has been organized by James K. Sweeney, founder and chairman of Computer Machinery Corp. The European operations are in association with Groupe Prest.

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Increasing Offerings

Centronics Planning Aggressive 1976

By Molly Upton
Of the CW Staff

HUDSON, N.H. – Centronics Data Computer Corp. intends to be as aggressive, if not more so, in 1976 as it was in 1975, Hank Weiss, director of marketing, said.

So far this year, the firm has announced 10 products, he said.

Centronics expects to accommodate rising customer demand for lower cost units and to increase its offerings into the 200- and 300 line/min area, he said.

The market areas Centronics is now in – printers with speeds from 88 char./sec to 200 line/min – will have a good, sustained growth of from 15% to 17% a year, he said. The firm has 16 printers and two teleprinter models.

Much of the effort next year, will be in finishing up products announced this year, he added. For instance, the firm will be including magnetic tape with its teleprinter Models 308 and 508. The firm is also planning products tailored to specific applications, he said.

Foreign Sales

In addition, sales in Europe and other foreign areas should grow at a rapid rate, he said.

Perhaps Centronics' most eye-catching product this year was the printer with four heads, the 104, introduced in Hannover, W. Germany. But four heads are not the maximum that can be put on a printer, said Ron Huch, vice-president of marketing. The limitation is imposed by space, with room for 11 or 12, he said.

Part of Centronics' key to success is its management's attitude, which is typified by this year's decision to increase product development and marketing support, Weiss said.

The company was originally planning five products for '75, he said, but increased this to 10 so the firm would be in a better position at the end of the recession.

The marketing force was expanded to increase the customer base and thereby counterreduced order volumes. Centronics now has more than 350 OEM customers compared with about 300 a year ago, he said.

Total shipments to date are over 50,000 units, Huch said.

One example of how Centronics takes advantage of economies of scale is its use of LSI. This reduces the cost of spare parts to the OEM, said Weiss.



CW Photos by V. Farmer

Huch Weiss

Centronics offers a step down decrease within families of products allowing OEM customers to decrease the price of units they purchase after reaching certain milestones in volume.

As an incentive to this plan, Centronics frequently adds similar products in more than one family, such as the 503 and the 103, said Weiss.

Back in 1971, Huch said, Centronics created an image by advertising in the end-user marketplace.

Today part of Centronics' market strength comes from demand by the end user to the OEM for a Centronics printer, Weiss said.

Service, Support

Centronics also has strengthened its service and support areas. It now provides service in more than 50 locations, either direct or third party, and more than 60% is done by Centronics personnel, Huch said.

The firm maintains an on-line diagnostic center, central dispatching of service personnel and a team that trains OEM personnel in receiving, inspection and system checkout.

Centronics has also prepared audio-visual courses for OEM service personnel and runs road shows on updated techniques.

Centronics has matured to the point where 24% of its manufacturing personnel are involved in quality assurance and control, Weiss said. The firm carefully tests and publishes mean time between failure down to the component level and stands by its claims, Huch said.

The firm's on-line diagnostics save time and money for nearly all involved, said Huch. Often a user's seemingly insignificant change in software will show up only when the system is running on-line, he explained.

By using the diagnostics, Centronics can pinpoint whether the trouble is in the printer, the modem, the communications lines or the mainframe, he said.

Centronics is in litigation with Core, its former distributor in Britain and Germany, and has established subsidiaries in England, France and Germany. It has about nine distributors in the rest of Europe, and within 90 days sales to Europe should be up as high as, if not higher than, they were before the dispute with Core, Weiss said.

The firm also has established distributors in South America, South Africa and Australia, he said.

Currently, about 30% of business is outside the U.S., and this should increase by 10% or 15% next year, he said.

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And the Winner...

VIENNA, Va. – Richard E. Bridgman, systems software technician for the Tulsa installation of Amerada Hess Corp., was the winning recipient recently of a free Johnson Systems, Inc.'s Job Accounting Report System.

Johnson offered the system as a prize in its "Great Giveaway" contest in the July 9 issue of *Computerworld*.

Over 1,000 computer-oriented companies, programmers, DP managers and engineers responded to the ad, which offered the holder of the randomly drawn coupon not only the actual system for the use of his company, but also a personal check for $1,000.

When Bridgman was notified his name and the name of his company had been drawn, he seemed "amazingly calm and cool," a Johnson spokesman said. Later that day he "closed up shop" and took off for the afternoon.

Promotes Software Awareness

SIA Image-Building Campaign Well Under Way

CINCINNATI – The image-building campaign launched by the Software Industry Association (SIA) is "very much under way," according to Lloyd Baldwin, president of the SIA section of the Association of Data Processing Service Organizations (Adapso).

The SIA consists of about 70 members and is affiliated with several overseas associations, he said.

The object of the image-building program, which involves increased press coverage of independent software, is to make computer users think of software as a professional industry and the first source of software, he said.

Currently users looking for software tend to go first to their hardware supplier, then try to do it themselves and finally consider obtaining services or products of software firms, Baldwin said.

Baldwin declined to distinguish which sector of the industry – packaged vs. custom programs – might be growing faster than the other, adding that most of the firms obtain revenues from each sector.

He estimated packaged business accounts for between 60% and 65% of total software revenues.

Software industry executives' expectations for 1975 ranged from 50% growth to 150% growth, he said, adding many firms have probably exceeded their growth expectations this year.

The SIA plans to submit an amicus curiae brief in favor of offering software the "protection we need that's on a par with that provided by patents in other areas" in a current patent case – G. Marshall Dun vs. Thomas R. Johnston, he said.

OTP Forms Export Policy Group

WASHINGTON, D.C. – An intergovernmental committee to deal with long-range and broad telecommunications export policies has been organized by the Office of Telecommunications Policy (OTP).

Several federal departments and agencies are working on separate programs which deal with the export of telecommunications technology, goods and services, acting OTP director John Eger said.

"OTP's goal is to form a mechanism through which a coordinated effort can obtain maximum results," he explained.

When the export of computers is excluded, the U.S. experiences a deficit balance of trade in telecommunications technology, goods and services.

"The committee will concentrate its attention on policy issues which will facilitate a more successful program of exports," he said.

When computers are included, last year's figures showed a 13% favorable balance of trade for the industry.

"While this is a decrease from the 57% favorable difference in 1969, it does indicate a positive trend from 1973 when there was an unfavorable balance of trade of $215 million," he said.

OTP has been devoting increased attention to the problem and initial analysis suggests certain nontariff barriers to trade may exist, Eger said.

"We believe the existence of these barriers is related to the lack of coordinated and effective government/industry approach, both short-term and long-term," he said.

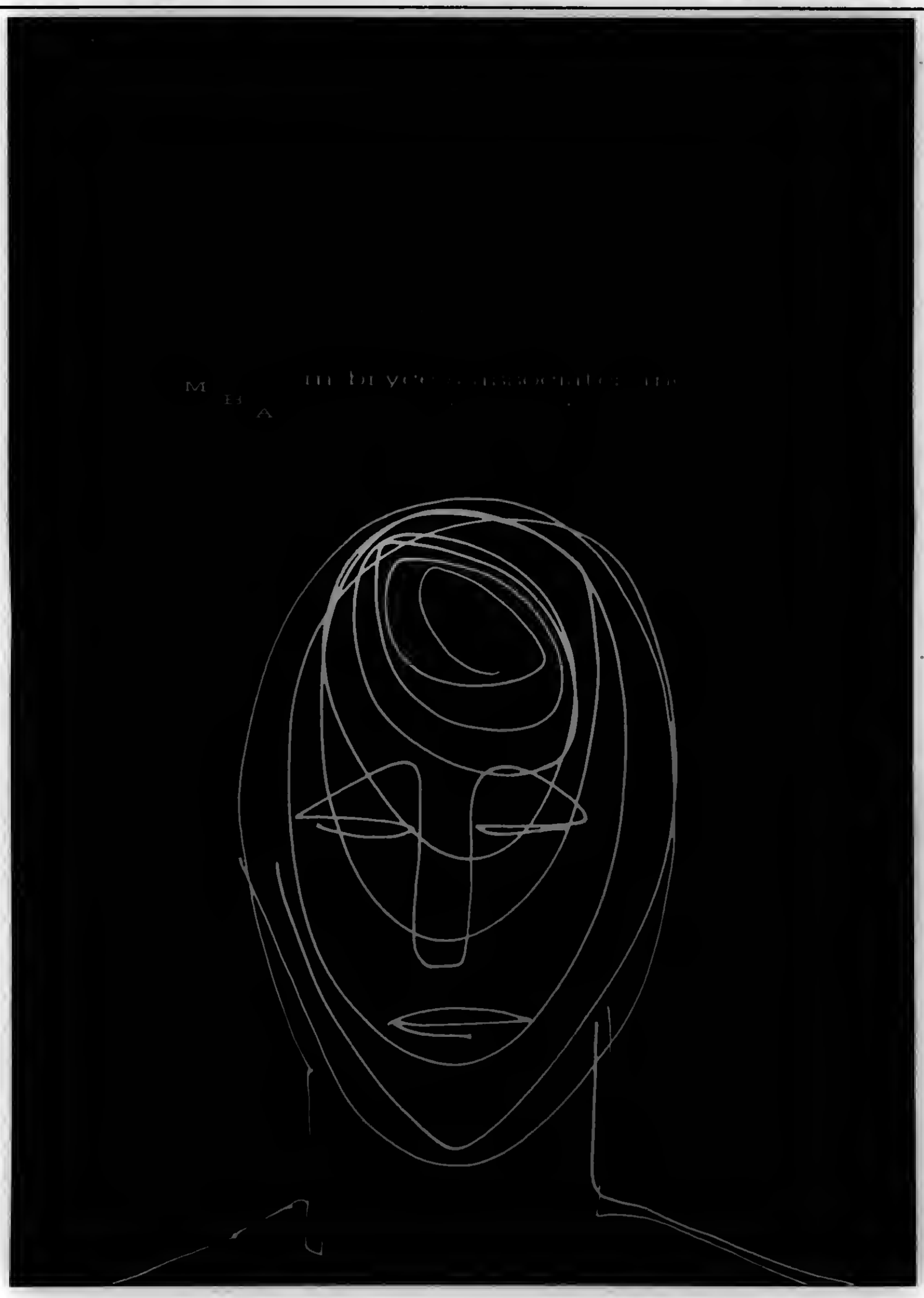
William L. Fishman, OTP assistant director for international communications, will coordinate the organization.

BCS Organizes Services Unit

DOVER, N.J. – Boeing Computer Services, Inc. (BCS) has formed a manufacturing services group called BCS-MS.

The first BCS-MS offering is a package designated the Manufacturing Data System, developed by the Data Services Division of the A.O. Smith Corp., for which BCS signed a licensing agreement.

The system offers the small to medium-sized manufacturing company an array of application modules including bills of materials, routings, order entry, forecasting and inventory management.





Multiprogramming/Multiterminal Unit

Nixdorf Eager to Challenge S/32 Market With 8870

CHICAGO – "It is not only a pleasure but a wonderful challenge to compete against IBM in this country," Heinz Nixdorf, president of Nixdorf AG, said as he unveiled Nixdorf's multiprogramming/multiterminal entry in the small system field, the 8870.

Nixdorf anticipates keeping the same 50-50 ratio of its installations in both large and small companies as it has with its 3,000 installations of the 800 series, he added. Marketing to larger firms provides a buffer during recessions, he observed.

Nixdorf Computer, Inc.'s revenues in the U.S. should double by 1977 over those of 1975, he added.

Satisfies Void

The Nixdorf 8870 is designed to satisfy what Nixdorf perceived as a void in the market, a single-source, turnkey system in the small to medium-size machine range, according to Dave Snyder, product manager. First-time users will be a special target group.

Currently there are few firms that provide hardware, software, service and financing for a product the size of the 8870, he said. Generally a user has to go to at least two sources to put a system together, he said.

The 8870 also, will be marketed as an upgrade of billing and accounting machines needing multiprocessing capability and in vertical markets, such as medical, wholesale/distribution and municipalities, Synder said.

Nixdorf provides standard application packages as well as performing custom programming, he said. The programs are written in Basic.

On-Line Diagnostics

By linking users on-line to a Nixdorf site, programmers can examine a user's application and make necessary changes, Snyder said, since the language is interpretive.

Nixdorf can do this because it writes the software and provides the service, so it knows what is in the system, he said.

The firm has about one maintenance person for every 35 sites, he added.

Snyder said there is a difference between the billing and accounting machine markets and the small systems area. In the billing and accounting machine area, the software is supplied almost exclusively by the hardware vendor, which encourages price cutting on the software portion in order to sell the product.

In small systems, however, the third-party software vendors have "made a market for applications software to a reasonable extent," he said.

"It's amazing the multiprogram/multiterminal market has developed so quickly without an acknowledged leader," he said.

IBM's projections for its System/32 show the market is "hungry for someone to attack it in logical, professional manner," he said.



CW Photo by V. Farmer

Dave Snyder

Grantee Set to Study Man/Machine Speech

PITTSBURGH, Pa. – Professor D. Raj Reddy of Carnegie-Mellon University has been awarded a fellowship from the John Simon Guggenheim Foundation for the study of man-computer communication.

Reddy has been working on systems which provide a voice answer in response to oral questions from the inquirer.

"We now have such systems which are restricted and are capable of only a few hundred words of speech," Reddy said. "The words must be carefully spoken; they must be concerned with very specific tasks and with language carefully tailored to the necessary task."

Reddy will use his grant to do research at laboratories in the U.S., Japan and Europe.

Executive Corner

■ Mark W. Schiedinger has been named vice-president of finance and peripheral products at Control Data Corp.

■ William G. Moore Jr. has been appointed vice-president of U.S. marketing operations at Inforex, Inc.

■ George J. Vosatka has been elected senior vice-president of General Automation, Inc.

■ Edward P. Boyhen has been named vice-president of engineering and program management for Southern Pacific Communications Co.

■ N. David Wheeler has been appointed vice-president of research and engineering at Mohawk Data Sciences Corp.

■ Arnold W. Morrison has been elected to the board of directors of Computer Communications, Inc.

■ Norman C. Lincoln has been appointed vice-president of operations of the Computer Systems Division of Harris Corp.

Logicomp Corp. has named Jean-Pierre Denis vice-president and general manager; Sven B. Svendsen, chairman of the board; Leonard A. Ehrig, president; John Sandberg, vice-president of engineering; and Lee Jensen, vice-president and treasurer.

■ Derek Richell has been named vice-president and general manager, and James D. Wylie vice-president of marketing and field operations.

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1) These books were written by an expert from industry, Kevin McQuillen. He's been a DP manager, consultant, and manufacturer's rep so his books are chock full of solid, practical, real world advice.

2) The content of these books is based on an analysis of the tasks normally required of an applications programmer. That's why these books contain everything of use to the average programmer, and very little that isn't. That's also why these books give substantial coverage to job control language. The DOS book covers DOS and DOS/VS. The OS book covers MFT, MVT, VS1, and VS2.

3) These books are organized by function. A complete subset of BAL is presented in the first three chapters of the book, and later chapters cover such functions as debugging, table handling, subprogram linkage, and file handling. When material is organized in this way, you learn more quickly because you always see purpose.

4) Each book contains dozens of complete program listings. They start with card-to-printer programs and end with programs that create and retrieve direct files. In between there are listings for routines and programs that perform code translations and input validations, set up the linkage between mainline modules and subprograms, load and use tables in storage, create and retrieve sequential and ISAM files, and so on. As a result, you will have many models of professional coding techniques upon which to build.

Content

The intent of these books is to develop a basic programming skill in assembler language. As a result, the initial emphasis of each book is on a professional subset of BAL along with the related debugging skills. If you did nothing more than master this material (chapters 1-5), I think you would justify the cost of the book several times over.

Beyond this, table handling, subroutine and subprogram linkage, and sequential and ISAM file handling are given primary emphasis. Since these are common programming functions, this material is valuable background regardless of the language you normally use.

Finally, these books show you how to write macro definitions (great background for working with software packages), how to code bit manipulation and translation routines, how to isolate the fields in free-form input data (a common function in teleprocessing programs), and how to work with direct files. This type of material starts you on your way to the more sophisticated tasks required in a computer installation.

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CW Photo by M. Upton

Richard Middleton and Marilyn Maleckas of HIS with PPS

HIS Exhibits PPS Device For First Time in Public

By a CW Staff Writer

NEW YORK – Honeywell Information Systems' (HIS) New York branch exhibited its Page Printing System (PPS) here at Info 75 last week.

The exhibit marked the first public showing of the system outside of local Honeywell offices, Russ Bishop, product manager said.

The system was purchased off the floor within the first two hours of the show, he said.

The PPS, which can be run off-line at a constant printing speed of 18,000 line/min, can produce up to 32 collated copies of a report, he said.

The unit is now in full production, and "market response has been really gratifying," Bishop said.

Inquiries at least doubled after IBM announced its high-speed printer system, he said, explaining that Honeywell announced the system about a year ago, and it was such a new concept, people were a little scared.

He said Honeywell is pleased to meet IBM head on in this market, from the standpoint of advantages it offers: deliveries; features; and price, which is about 20% less than IBM. Delivery is 90 days.

Customer sites are in Boston, Pittsburgh, Dallas, Los Angeles, Akron and Philadelphia, and the one from the floor will be installed within a couple of weeks in New York, he said.

In American DP

ICL, Olivetti Seeking Market Identity

By Molly Upton
Of the CW Staff

NEW YORK – International Computers Ltd. (ICL) and Olivetti Corp. exhibited at Info 75 here last week, both seeking to establish a greater identity in the American computer market.

"One of the big obstacles to marketing in the U.S. is people don't think of Olivetti as they ought to," according to Ira Zweifler, national account manager. He added the firm is number two or three worldwide in communications.

"The major problem is letting people know who we are," he said.

Olivetti feels it has two key advantages in selling to the small systems market, he said. It has traditionally marketed turnkey systems and has developed in-house expertise in applications, Zweifler said.

The Olivetti A5 and A7 are sold almost exclusively as turnkey systems, he said.

CW at Info 75

Olivetti has 92 district offices in the U.S. and 700 agents, with about 900 service points.

The initial version of the TC 800 will be sold to the banking market, especially thrift institutions, he said, and later to the wholesale, distribution, law enforcement and municipal government markets.

Olivetti makes all of the 800's components with the exception of line printers, he added. The 32K CPU will be expanded to 64K soon, and the 50 char./sec printer will be upgraded to a 330 char./sec dot matrix printer, he said.

The firm will begin production of the 800 at the end of the year, Zweifler said. About 1,500 have been sold in Canada, he added.

ICL showed a 2903 at Info to generate leads and convince people of its serious intent in the American market, according to David Crocombe, vice-president of marketing.

The firm, which markets only out of New York City, has achieved about 98% of its goal, with 13 installations out of a target of 15, he said.

Crocombe anticipates an even better year next year, as it now has an established customer base for references, he said.

Most of its installations are in the distribution and manufacturing area, he said.

A year ago ICL announced it was looking for a partnership venture in the U.S., he observed.

An analysis of the U.S. market is expected within a month, when decisions will be made whether to expand product offerings and locations in the U.S., he said.

Orders & Installations

General Electric's Information Services Business Division has installed Honeywell's HS4400 computer to provide expanded capabilities for its medium-to-large process control applications.

The State of Washington has ordered Adabas from Software AG. Adabas will be used for a statewide library system and personnel payroll system.

Albertson's, Inc., has converted 13 of its 230 supermarkets to electronic checkout equipment from NCR. The order includes 108 NCR 255 terminals and 13 NCR 726 in-store computers.

Consultants & Designers, Inc., a temporary help agency, has ordered "Micos," a turnkey system from Mini-Computer Systems, Inc.

Gulf Research & Development Co. has installed a Univac 1110 multiprocessor system at its Houston Technical Services Center to be used for seismic data processing.

Valley Bank of Nevada has installed dual Burroughs B4700s and has ordered Burrough's TT 102 Transaction Terminal Systems for installation in its branch offices.

The Albuquerque Publishing Co. has installed an NCR Centry 201 computer and 25 NCR 285 credit-authorization terminals to provide a variety of services for its advertising and accounting departments.

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This position requires a broad knowlege of the most effective methods for the presentation of technical information as well as in-depth technical knowledge and excellent writing skills as you will work from functional specifications and other basic source material. Applications programming experience is necessary.

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You must have a good understanding of software concepts and be able to work from basic source material. Primary responsibility will be the writing of software manuals. Applications programming experience is necessary.

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This position require a self-starting publications expert with proven performance in the areas of editing, production coordination, control and liaison and coordination with internal publications department and sub-contract houses. You should have 3-5 years experience and a thorough knowledge of estimating, composition, layout, artwork, photography and printing.

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Analyzing software documentation from a user's point of view you must have sufficient software knowledge to evaluate technical accuracy, completeness, clarity, etc. In addition you will participate in field test by preparing documentation quality test and administering them to select customers and ensure error recover procedures are clear. This position requires applications programming experience and excellent human relations and communications skills. Experience as a user is most desirable.

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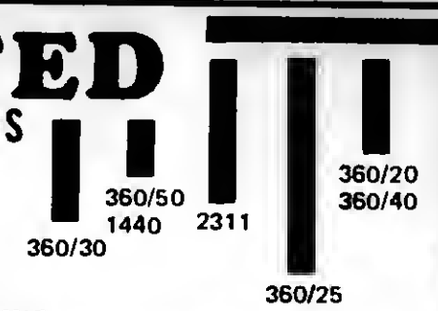
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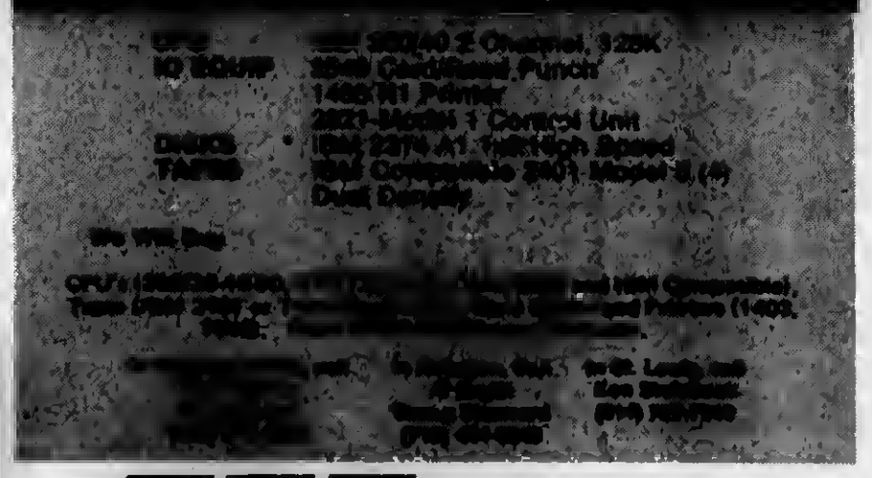
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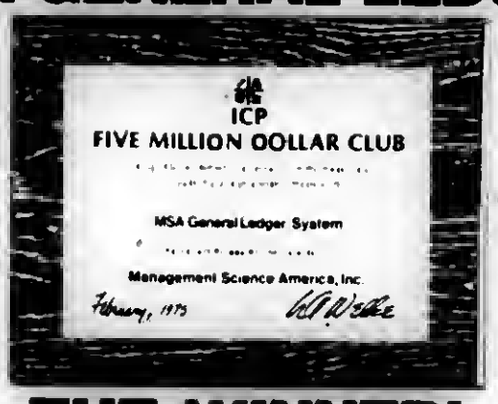
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Despite Revenue Rise

Quarter Earnings Dip at Ampex

REDWOOD CITY, Calif. – Revenues increased in the first quarter at Ampex Corp., as did pretax operating income. However, earnings declined because of the $13 million settlement paid by IBM last year.

Revenues for the period rose to $63.7 million compared with $61.3 million in the year-ago period.

Income from continuing operations before special credits rose 23% to $2 million compared with $1.6 million a year ago.

Earnings for the period were $1.6 million or 14 cents a share compared with $13.1 million or $1.21 a share in the same period last year.

Debt Shrinks

Debt was reduced $11 million in the first quarter.

At the shareholders' annual meeting, Chairman Richard J. Elkus observed many of the goals planned for completion over a five-year period have been obtained after the third year of the "new Ampex." This acceleration, he said, should have a positive effect on the future.

The firm's disk product line has benefited from a shift in emphasis to OEM marketing. "Our fourth quarter generated the highest quarterly booking order for OEM disk products in the company's history," said President Arthur H. Hausman.

Ampex is currently discussing its Terabit mass memory systems with a number of large OEM computer systems manufacturers both in the U.S. and abroad, he said.

International Nearly Half

Over the past 3-1/2 years, Ampex has reduced debt more than 50% to $124 million from $253 million.

International business has grown from 27% to 45% of the firm's total volume.

Two-thirds of the company's sales last year were attributable to products less than five years old, he said, observing the company's potential for growth is considerable.

Ampex's sales of magnetic tape have increased almost 60% in the last three years, he added, and last year international sales of magnetic tape products increased 40% over the year before.

During fiscal 1975, Ampex sales of magnetic tape totaled $54 million or 22% of sales, Hausman said.

GCC Half-Year Net Slips

PHOENIX – Greyhound Computer Corp.'s (GCC) second-quarter and six-month earnings dipped sharply from year-ago figures.

The declines were primarily attributable to unfavorable first-half data services results, President Olie E. Swanky said.

For the quarter ended June 30, the firm's earnings dipped to $91,000 or 2 cents a share compared with $308,000 or 7 cents a share in the year-ago period.

Revenues grew to $15.3 million compared with $13.7 million.

During the six months, earnings dropped to $140,000 or 3 cents a share compared with $746,000 or 17 cents a share in the year-ago period.

Revenues grew to $31.2 million in the six months compared with $26.5 million in the same period last year.

The continuing decline in computer leasing revenue levels was approximately offset by the contribution of the new subsidiary, Computer Leasing Co., and slightly lower than average short-term interest rates, Swanky said.

STC Proceeds to Increase Lease Base As Six-Month Income, Revenues Climb

LOUISVILLE, Colo. – Along with increased earnings and revenues for the second quarter and six months, Storage Technology Corp. (STC) proceeded apace with its plan to increase its own lease base rather than selling to third-party lessors.

For the second quarter, total revenues of $20.8 million compared with $18.1 million in the year-ago period. The sales portion rose to $12.9 million compared with almost $11.9 million in the same 1974 quarter, while rental and service revenues grew to $7.9 million from $6.2 million in the same quarter last year.

Quarterly earnings for the period ended June 27 totaled $1.4 million or 36 cents a share compared with $1.2 million or 33 cents a share in the year-ago period.

Revenues Rose

During the six months, revenues increased to $40.3 million compared with $34.3 million in the 1974 half. The sales portion rose to $25.1 million from $22.7 million, while rental and service income grew to $15.2 million compared with $11.7 million in the same period last year.

Earnings totaled $2.7 million or 69 cents a share compared with $2.4 million or 63 cents a share in the half last year. The 1974 earnings per share have been adjusted to reflect a 5% stock dividend in the first quarter.

STC will show the major portion of its $12.2 million sale of tape drives to the Social Security Administration during the third quarter.

In keeping with its plans to increase its own lease base, the firm has added $8.9 million of gross rental equipment to its balance sheet. STC's current plans require no additional bank borrowings over those available, the firm said.

Production is up about 65% for the first half compared with that of 1974, the firm said.

ICL Six-Month Results Rise 21%

Value of Orders Received Up 19%

LONDON – International Computers Ltd.'s (ICL) six-month results rose 21% over the same period last year, while the value of orders received rose about 19%. Two-thirds of the increase in orders was attributable to a price increase of 12%, *Computer Weekly* said.

Revenues totaled nearly $240 million in the half year ended March 31, while profits before taxes rose 22% to $15.3 million, aided by a smaller loss from Computer Leasings, its finance subsidiary.

For 1974, the subsidiary lost about $4.1 million whereas for the six months, the loss totaled $138,240, the paper said.

ICL's overseas business accounts for about 46% of total orders, which is about the same percentage as in the year-ago period, but ahead of the 41% for the full year 1974.

The firm increased its borrowings to about $40.2 million from $10.2 million in the year-ago period, which is well within the limit of $73.4 million, the report said.

Contracts

Ampex Corp. has received a $1 million contract from Singer Business Machines to supply TMB tape drives and DE-835 phase-encoded formatters for Singer's System Ten.

On-Line Systems, Inc. has been awarded a five-year computer services contract from Dynabank Corp.

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Earnings Reports

COMSHARE
Year Ended June 30

	1975	a1974
Shr Ernd	$1.10	$1.13
Revenue	12,312,389	9,509,124
Tax Cred	744,000	702,000
Earnings	1,499,440	1,503,062
3 Mo Shr	.24	.54
Revenue	3,544,609	2,496,325
Tax Cred	179,000	306,000
Earnings	335,401	b710,327

a-Restated for a change in accounting. b-Includes pretax gain of $624,000 from sale of shares of an affiliate.

DICOMED
Six Months Ended June 30

	1975	a1974
Shr Ernd	.....	$.25
Revenue	$608,360	747,475
Tax Cred	.....	60,000
Earnings	(1,870)	122,079

a-Restated to reflect accounting change which expensed R&D costs as incurred.

TEC
Year Ended June 30

	1975	1974
Shr Ernd	$.41	$.80
Revenue	8,005,193	8,204,865
Earnings	277,726	543,580

APPLIED DATA RESEARCH
Three Months Ended June 30

	1975	a1974
Shr Ernd	$.10	$.01
Revenue	3,291,828	2,227,631
Disc Op	b(44,443)	.....
Spec Cred	57,000	.....
Earnings	119,633	9,552
6 Mo Shr	.12	.....
Revenue	6,467,728	4,376,012
Disc Op	b(131,840)	.....
Spec Item	68,000	d(411,469)
Earnings	142,958	(413,073)

a-Restated. b-Includes gain of $17,949 from disposition of a division. d-Cumulative effect of an accounting change.

DATA DOCUMENTS
Three Months Ended June 30

	1975	1974
Shr Ernd	$1.27	$1.95
Revenue	16,424,815	15,260,110
Tax Cred	.....	36,946
Earnings	598,298	915,311
9 Mo Shr	4.72	4.85
Revenue	47,984,325	39,328,226
Tax Cred	5,000	102,063
Earnings	2,219,454	2,276,547

TEXAS INSTRUMENTS
Three Months Ended June 30

	1975	1974
Shr Ernd	$.49	$1.10
Revenue	330,961,000	403,386,000
Earnings	11,295,000	25,229,000
6 Mo Shr	1.10	2.19
Revenue	663,718,000	778,865
Earnings	25,287,000	49,983,000

TYMSHARE
Three Months Ended June 30

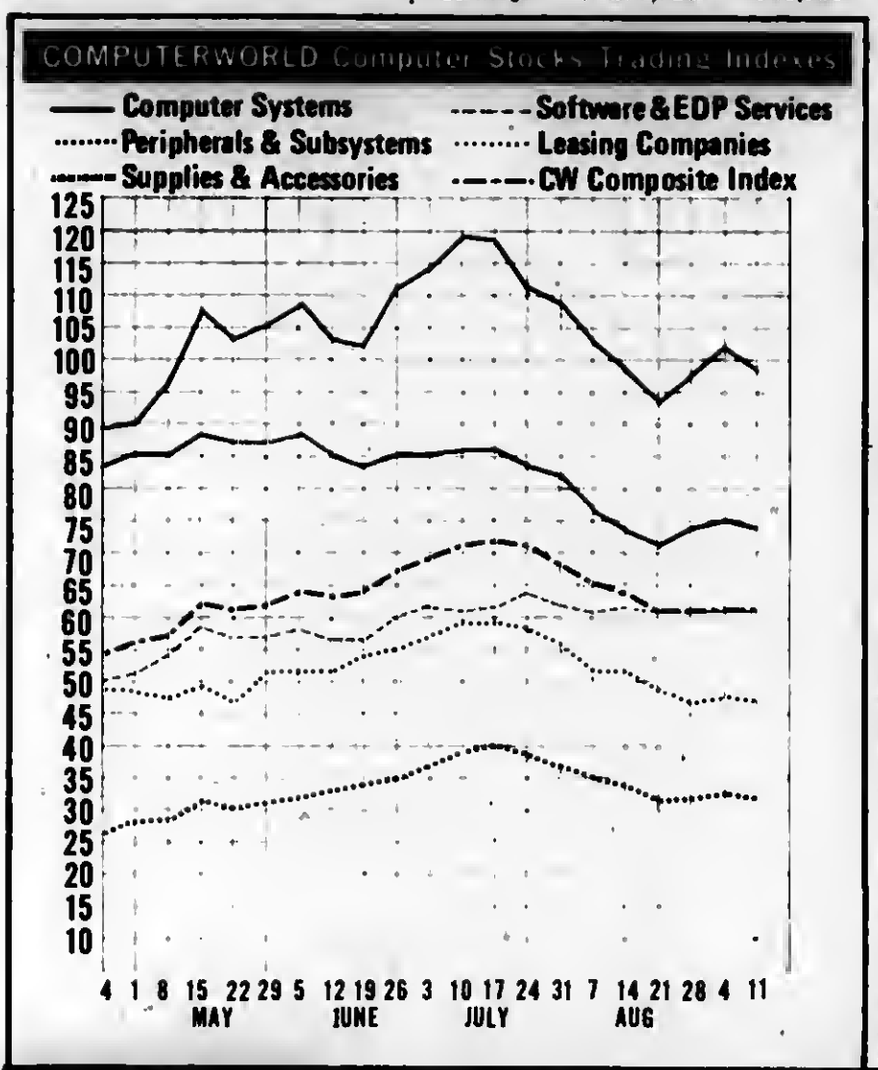
	1975	a1974
Shr Ernd	$.30	$.21
Revenue	13,959,376	11,383,400
Tax Cred	25,000	35,000
Earnings	1,140,947	791,154
6 Mo Shr	.61	.42
Revenue	27,994,322	22,596,493
Tax Cred	125,000	121,000
Earnings	2,326,213	1,580,476

a-Restated.

TAB PRODUCTS
Year Ended May 31

	a1975	1974
Shr Ernd	$1.63	$1.04
Revenue	35,824,000	26,712,000
Earnings	1,358,000	867,000
3 Mo Shr	.28	.37
Revenue	8,631,000	7,746,000
Earnings	230,000	307,000

a-Reflects change to Lifo accounting and other accounting adjustments.



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Computerworld Stock Trading Summary

CLOSING PRICES TUESDAY, SEPTEMBER 9, 1975

All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE (1)	CLOSE SEP 9 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	EURROUGHS CORP	62-109	8T	-3 3/4	-4.1
C	COMPUTER AUTOMATION	2- 10	e 5/8	0	0.0
N	CONTROL DATA CORP	11- 23	16	-I	-5.8
M	DATA GENERAL CORP	10- 38	27 1/8	-I T/8	-6.4
O	DATAPOINT CORP	6- 26	I9 1/4	-1 1/2	-T.2
O	DIGITAL COMP CONTROL	1- 4	3 1/4	- 1/4	-T.I
N	DIGITAL EQUIPMENT	46-122	111 1/2	-2 1/8	-1.8
M	ELECTRONIC ASSOC.	2- 3	2 1/2	0	0.0
A	ELECTRONIC ENGINEER.	5- 10	8 1/2	- 1/4	-2.8
A	FOXBORO	23- 42	26 1/8	-3 T/8	-12.9
O	GENERAL AUTOMATION	6- 14	T 1/8	-1	-12.3
C	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	58-120	90 1/8	-1 1/4	-1.3
N	HONEYWELL INC	22- 40	29 1/2	- 1/2	-1.6
M	IBN	158-224	IT9	-3 3/4	-2.0
C	MEMOREX	0- 0	T	- 1/4	-3.4
O	MICRODATA CORP	2- 6	5 1/2	+ 1/8	+2.3
C	MODULAR COMPUTER SYS	5- 19	12	- 1/4	+2.0
N	NCR	15- 39	26 3/4	-1 1/2	-5.3
C	PRIME COMPUTER INC	2- 6	5	- 1/4	-4.T
M	PERKIN-ELMER	16- 30	24	- 1/2	-2.0
M	RAYTHEON CO	2A- 59	53 1/4	+I 1/2	+2.8
M	SINGER COMPANY	10- 1T	12 3/8	- 1/8	-1.0
N	SPERRY RAND	26- 49	3T 1/4	-2 1/2	-6.2
A	SYSTEMS ENG. LABS	1- 5	3 1/8	- 1/4	-T.4
O	ULTIMACC SYSTEMS INC	1- 6	5 5/8	0	0.0
A	VARIAN ASSOCIATES	T- 18	13 1/2	- 7/8	-6.0
M	WANG LABS.	T- 1T	11 1/2	- 1/2	-4.1
A	XEROX CORP	51- R6	52 1/4	-4 5/8	-8.1
	LEASING COMPANIES				
C	COMDISCO INC	1- 5	3 1/4	- 1/8	-3.7
A	COMMENCE GROUP CORP	2- 4	3	0	0.0
A	COMPUTER INVSTNS GRP	1- 2	5/8	-	-9.1
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	1- 1	1/2	0	0.0
N	DPF INC	3- 6	4 7/8	+ 1/8	+2.4
O	EDP RESOURCES	1- 2	I	0	0.0
A	GRANITE MGT	1- 5	4 1/8	+ 3/8	+10.0
A	GREYHOUND COMPUTER	2- 3	2 7/R	0	0.0
A	ITEL	3- 9	5 3/4	- 3/8	-6.1
N	LEASCO CORP	4- 8	5 1/2	- 1/8	-2.2
O	LEASPAC CORP	1- 1	1/4	0	0.0
C	LECTRO MGT INC	1- 1	1/8	0	0.0
C	MRG INC	1- 4	2 3/R	0	0.0
A	PIONEER TEX CORP	2- 7	4 3/4	0	0.0
A	ROCKWOOD COMPUTEN	1- 1	1/4	0	0.0
N	U.S. LEASING	8- 14	T 1/2	- 3/8	-4.7

EXCH		1975 RANGE III	CLOSE SEP 9 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
C	ADVANCED COMP TECH	1- I	T/8	- 1/8	-12.5
A	APPLIED DATA RES.	1- 10	1 3/4	0	0.0
N	AUTOMATIC DATA PROC	29- 65	5I I/2	- T/8	-1.6
O	BRANDON APPLIED SYST	1- 1	I/e	0	0.0
O	CENTRAL DATA SYSTENS	3- T	6 5/8	0	0.0
C	COMPUTER DIMENSIONS	2- 6	4	0	0.0
C	COMP ELECTION SYSTMS	3- 6	5 1/2	0	0.0
C	COMPUTER HORIZONS	I- 1	3/4	0	0+0
O	COMPUTER NETWORK	1- 3	2 3/8	+ 1/8	+5.5
A	COMPUTER SCIENCES	2- 6	5 1/8	- 1/8	-2.3
C	COMPUTER TASK GROUP	1- 1	5/e	0	0.0
C	COMPUTER USACE	2- 4	2 1/4	0	0.0
C	COMPSHARE	3- 4	2 T/8	0	0.0
C	DATATAB	1- 2	1 5/8	0	0.0
A	ELECT COMP PROG	1- I	1/4	0	0.0
M	ELECTRONIC DATA SYS.	12- 28	15 1/2	-2 1/4	-12.6
C	INFONATIONAL INC	1- 1	1/8	0	0.0
C	IPS COMPUTER MARKET.	1- 1	3/4	0	0.0
C	KEANE ASSOCIATES	0- 0	2 1/8	- 1/8	-5.5
O	KEYDATA CORP	2- 3	2 3/8	- 1/8	-5.0
C	LOGICON	3- 5	3 3/4	0	0.0
A	MANAGEMENT DATA	1- 3	1 T/8	0	0.0
C	NATIONAL CSS INC	6- 14	12 1/2	- 1/4	-1.9
O	NATIONAL COMPUTER CO	I- I	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	11 3/4	-2	-14.5
M	PLANNING RESEARCH	2- 6	4	0	0.0
C	PROGRAMMING & SYS	1- I	5/8	0	0.0
C	RAPIDATA INC	2- 5	3 3/8	- 1/2	-12.9
O	REYNOLDS & REYNOLD	10- 24	11 1/2	+ 1/2	+4.5
C	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
C	SIMPLICITY COMPUTER	1- 1	T/8	0	0.0
O	TYMSHARE INC	T- 21	17 1/8	-2	-10.4
A	URS SYSTEMS	2- 4	3 1/4	+ 1/8	+4.0
A	WYLY CORP	2- 4	3 1/8	+ 1/8	+4.1
	PERIPHERALS & SUBSYSTEMS				
M	ADDRESSOGRAPH-MULT	4- 9	T	+ 1/8	+1.8
O	ADVANCED MEMORY SYS	1- T	4 1/4	- 1/4	-5.5
N	AMPEX CORP	3- T	5 1/4	- 1/4	-4.5
C	ANDERSON JACOBSON	1- 3	2 1/4	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 5	2 7/R	- 1/R	-4.1
A	BOLT,BERANEK & NEM	5- 13	9 7/8	- 1/2	-4.8
N	BUNNEN-RAND	4- 8	4 1/2	- 1/8	-2.7
A	CALCOMP	4- T	3 3/4	- 1/4	-6.2
O	CAMBRIDGE MEMONIES	3- 5	3 1/2	- 1/4	-6.6
N	CENTRONICS DATA COMP	T- 25	15 1/4	- 3/4	-4.6
C	CODEX CORP	15- 38	33	- 1/2	-1.4
C	COGNITRONICS	1- 2	1	0	0.0
C	COMPUTER COMMUN.	1- 2	1	0	0.0
C	COMPUTER CONSOLES	3- T	3 3/4	0	0.0
A	COMPUTER EQUIPMENT	1- 2	1 5/8	0	0.0
O	COMPUTER MACHINERY	1- 2	1 1/2	0	0.0
C	COMPUTER TRANSCEIVER	1- 2	1 1/8	0	0.0
O	CONTEL	2- 5	3 1/8	- 3/8	-10.T

EXCH		1975 RANGE III	CLOSE SEP 9 1975	WEEK NET CHNGE	WEEK PCT CHNGE
A	CONRAC CORP	12- 23	1T 1/2	- 1/4	-1.4
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
C	DATA 100	5- 16	9 3/8	- 3/8	-3.8
A	DATA PRODUCTS CORP	2- 6	3 5/8	+ 1/R	+3.5
C	DATA TECHNOLOGY	1- 3	1 5/8	- 1/4	-13.3
O	DATUM INC	1- 2	1 1/8	- 1/4	-18.1
O	DECISION DATA COMPUT	4- T	4 5/e	- 1/4	-5.1
O	DELTA DATA SYSTEMS	1- I	1/8	- 1/8	-50.0
O	DIMAN CONTROLS	1- 1	3/4	0	0.0
M	ELECTRONIC M & M	I- 3	L T/8	+ 1/8	+T.1
C	FABRI-TEK	1- 1	1	0	0.0
O	GENERAL COMPUTER SYS	1- 2	I I/2	+ 1/4	+20.0
M	HAZELTINE CORP	3- 6	3 T/8	+ 1/8	+3.3
N	HARRIS CORP	18- 20	22 1/2	-1 1/2	-6.2
A	INCOTERM CORP	3- 12	9 1/2	- 1/4	-2.5
O	INFOREX INC	2- 5	2 5/e	- 1/4	-8.A
G	INFORMATION INTL INC	8- 14	9 3/4	- 1/4	-2.5
A	LUNDY ELECTRONICS	3- 3	2 T/8	0	0.0
C	MANAGEMENT ASSIST	1- I	3/8	- 1/8	-25.0
A	PILCO ELECTRONICS	8- 24	16	-1	-5.8
A	MOHAWK DATA SCI	I- 5	3 1/4	0	0.0
C	OPTICAL SCANNING	1- 3	3	0	0.0
C	PENRIL CORP	2- 2	1 1/4	- 1/8	-9.0
O	PERTEC CORP	2- 8	5 1/4	+ 3/8	+T.A
A	POTTER INSTRUMENT	2- 2	I 3/4	0	0.0
C	PRECISION INST.	1- I	3/4	0	0.0
O	QUANTOR CORP	2- 6	5 1/8	0	0.0
O	RECOGNITION EQUIP	2- 9	6	- 3/8	-5.8
M	SANDERS ASSOCIATES	3- 11	T I/2	+ 1/8	+1.A
O	SCAN DATA	t- 3	1 3/4	- 1/8	-6.6
O	STORAGE TECHNOLOGY	6- 1T	12 1/4	-1 1/8	-8.4
O	SYCOR INC	5- 15	13 1/2	0	0.0
O	T EAR INC	3- 6	5 5/8	+ 1/8	+2.2
O	TALLY CORP.	1- 5	3 1/8	- 1/8	-3.8
C	TEC INC	1- 4	3	+ 1/4	+9.0
M	TEKTRONIX INC	18- 41	35 1/4	+ 1/2	+1.4
N	TELEX	I- 3	2 1/4	+ 1/8	+5.8
C	TANGO INC	4- 9	6	- 1/4	-4.0
C	TILTEK INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 3/4	+ 1/4	+5.5
A	BARRY WRIGHT	5- 7	6	- 1/2	-7.6
O	CYBERNATICS INC	1- I	1/2	0	0.0
A	DATA DOCUMENTS	29- 42	34 1/4	+ 3/8	+1.1
O	DUPLEX PRODUCTS INC	12- 25	16 1/8	- 1/2	-3.0
A	EMMIS BUS. FORMS	5- 7	5 3/8	+ 1/8	+2.3
C	GRAHAM MAGNETICS	5- 10	8 1/2	+ 1/4	+3.0
O	GRAPHIC CONTROLS	8- 21	11 1/2	- 3/4	-6.1
M	3M COMPANY	43- 68	53 1/4	-1 3/8	-2.5
C	MOORE CORP LTD	39- 51	44 1/4	- 1/2	-1.1
N	NASHUA CORP	11- 22	11 3/4	- 7/8	-6.9
C	STANDARD REGISTER	11- 20	1A	- 1/4	-1.5
O	TAB PRODUCTS CO	4- 8	6	+ 1/4	+4.3
N	UARCO	17- 24	19	- 5/8	-3.1
C	VANLEN GRAPHICS CORP	4- 7	4 1/4	- 1/2	-10.5
A	WABASH MAGNETICS	3- 5	4 1/8	0	0.0
M	WALLACE BUS FORMS	15- 25	16 1/2	- 1/2	-2.9

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NEWSPAPER

Looks at DBMS

Survey Shows Users Pleased With Systems

By Don Leavitt
Of the CW Staff

Current users of all the more popular data base management systems (DBMS) are generally happy, but users of DBMS from independent software houses tend to like their systems better than users of IBM's IMS like theirs.

Those conclusions were drawn from responses to a questionnaire run on *Computerworld*'s editorial page last month [CW, Aug. 27]. Though based on data gathered separately, they confirmed conclusions of a Datapro Research Corp. survey published last October.

CW's survey asked two questions with quantifiable answers: "How would you rate the capabilities of your DBMS?" and "How would you rate vendor support?" CW provided four possible answers to each, ranging from "excellent" to "needs improvement."

Weighting responses on a four-point scale (with "excellent" valued at 4, and "needs improvement" valued at 1), Adabas from Software AG came up with the highest weighted averages. Fifteen Adabas users responded and graded their package capabilities at 3.73 and vendor support at 3.25.

System 2000 from MRI Systems Corp. garnered the next highest weighted average scores. Package capabilities were deemed better than good, at 3.27, and vendor support came in with an even higher score, 3.48.

'Total' Popularity

Cincom System's Total showed its popularity – industry estimates have pegged its installed user base at close to or larger than IBM's IMS base – with responses received from 66 users. Their combined opinion was that the package was worth 3.24 on the four-point scale, but vendor support slipped below the 3.0 of "good" to 2.76.

"Ballots" were received from another 66 users working with IBM data base systems – various versions of IMS, including the DL/I subset. Overall, they saw the software as worth 2.97 and vendor support worth 2.63.

Only five users of IDMS from Cullinane Corp. reported their evaluations – which were all in the "good" or "excellent" area – so weighted averages were not calculated for that DBMS. In similar fashion,

(Continued on Page 2)

CW Special Report On
Data Base
Management Systems
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In Measuring Performance

Three Users Find SMF Inadequate

By Don Leavitt
Of the CW Staff

FORT LEE, N.J. – IBM's System Management Facilities (SMF) is inadequate as a performance measurement tool, according to three separate studies.

IBM literature, however, describes SMF as an optional support function that "collects and records system information. The information obtained can be used in management . . . reports that describe system efficiency, performance and usage."

SMF has long been considered at least imprecise by a number of independent people concerned with computer performance evaluation. Now there is new evidence indicating just how inadequate SMF really is.

The evidence comes from studies conducted recently at three separate users' installations. In each case the study was geared to evaluation of IBM's and an independent vendor's sort package, and each utilized a hardware monitor to get what were finally considered accurate measurements.

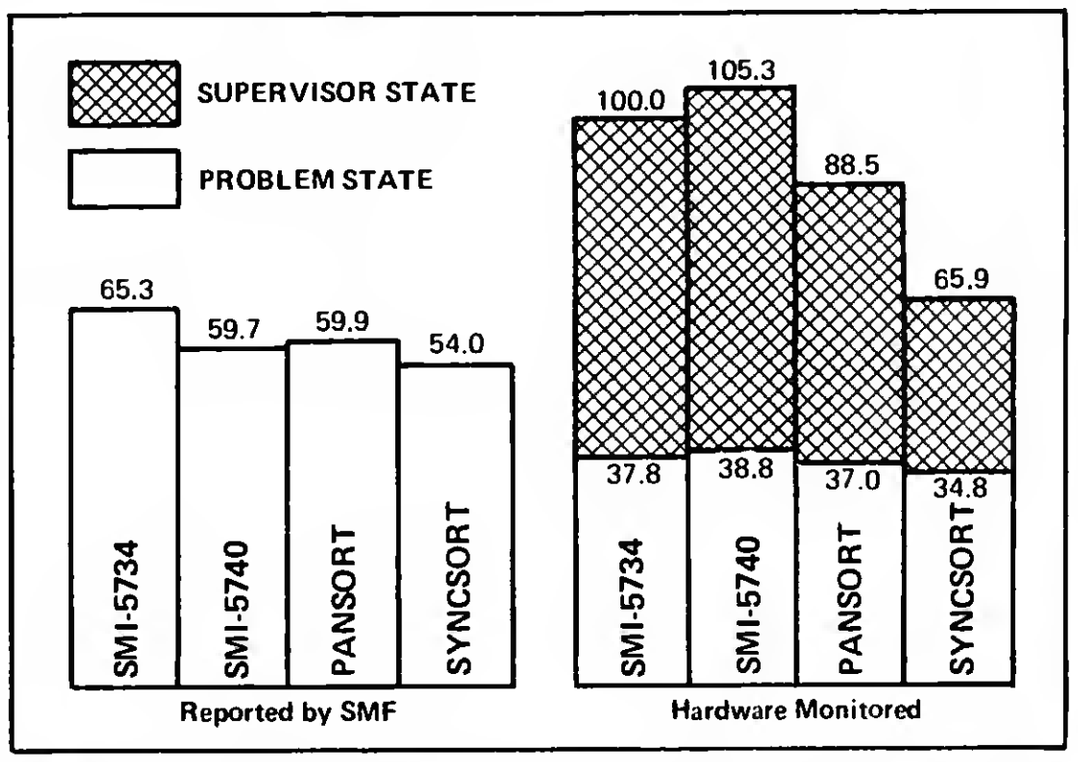
The users involved were the R.H. Donnelly Corp. of Des Moines, Iowa; Transamerica Information Services, Los Angeles; and First National State Bank (FNSB) of New Jersey, Newark, N.J.

Each evaluated Syncsort from Whitlow Computer Systems, Inc. and one or more of IBM's sorts. FNSB also evaluated Pansort from Pansophic Systems.

Transamerica has its own hardware monitor permanently attached to its CPU and uses it for system tuning as well as evaluations of new products. A Tesdata 1020-D hardware monitor – the little Microsum was leased especially for the tests at Donnelly and, apparently, at FNSB as well.

Scott Moore of Donnelly was the first of the three users to become concerned about SMF during the sort evaluations. He found SMF recorded equal CPU utilization by both Syncsort and IBM's SM1-5740 in handling one of the company's typical sorts, but supervisor state CPU time of SM1-5740 appeared to be

(Continued on Page 4)



Using the hardware-monitored CPU time – supervisor state plus problem state – of IBM's SM1-5734 as a norm, First National State Bank of New Jersey compiled these comparisons. The SMF data (left) lumped supervisor and problem state times together. The hardware monitor data differentiated and identified far more supervisor time than SMF was able to log.

U.S. May Use Xerox Data in IBM Case

By Edith Holmes
Of the CW Staff

NEW YORK – In response to a subpoena, Xerox Corp. shipped 5,000 pages of documents dealing with its decision to leave the computer industry to the Department of Justice last Wednesday.

The government plans to explore the Xerox exit for possible use in its antitrust suit against IBM, Raymond M. Carlson, lead attorney for the U.S., told Judge David N. Edelstein, the sole arbiter in the case, during an in-trial hearing held here last week.

While the trial is scheduled to reconvene Monday, Sept. 22, following a two month recess, Carlson said there will be time in the weeks ahead to discuss the Xerox exit.

His staff will review the documents sent by Xerox and then discuss with IBM counsel those which the government will enter as evidence in its case, he said.

Trying charges that IBM monopolized the general-purpose computer systems market from the early 1960s to the early 1970s, U.S. vs. IBM recessed in the middle of July to give both parties time to complete discovery and depositions relating to the so-called "new issues" – charges that IBM monopolized the peripherals and leasing markets of the industry.

On the Docket

The government will reopen its case with the continuation of the market definition aspects of the suit. Beginning this week with James H. Binger, chairman of the Executive Committee of Honeywell, and Clarence W. Spangel, executive vice-president of Honeywell, several industry witnesses will take the stand in the next few weeks.

William C. Norris, chief executive officer and president of Control Data Corp., will follow Binger and Spangle if he returns in time from a visit with the Israeli prime minister.

The government expects to have some changes in those areas of its witness list relating to peripherals, the Xerox documents just received and some financial aspects of the case developed this summer, Carlson said.

(Continued on Page 4)

CDC Takes Plunge to Key-to-Disk With 'Distributed Data Entry' Unit

By Patrick Ward
Of the CW Staff

MINNEAPOLIS – Control Data Corp. has entered the key-to-disk arena with a "distributed data entry" product CDC said can handle up to 63 local or remote keystations.

The system, called Cyherdata, allows large users to replace five or six small, separate key-to-disk systems with two of the larger Cyherdata systems, a CDC spokesman said.

The CDC product can also support just one or two keystations in remote areas where that is all the capacity needed, he said.

The Cyherdata system will be able to offer further hardware consolidation next March when CDC adapts it to concurrently drive CDC optical character recognition (OCR) equipment in the background area while data entry continues in the foreground, the vendor said.

Currently available Cyherdata systems can handle OCR separately, permitting a user to do key entry during the day and then use the system's processor to run an OCR device at night, the CDC spokesman said.

The Cyherdata system currently cannot transmit batch data to a host computer. However, CDC said it will offer IBM 3780-compatible transmission capability in November, and early next year a CDC-compatible line protocol will be

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CDC Takes Dive Into Key-to-Disk Waters

(Continued from Page 1)

available, the firm said.

A concurrent tape-to-print capability will also be offered as a major Cyberdata enhancement set for next March, the CDC spokesman added.

Introduced 'Too Soon'

CDC originally introduced the Cyberdata system in Europe two years ago. That was "too soon," and led to some problems, the spokesman said.

The North American version is an enhanced and time-tested unit, he added.

Like other key-to-disk systems, the Cyberdata system formats and edits keyed data. The system signals an operator when its error or range checks find a discrepancy.

The data entry supervisor can create formats by keying them onto the screen, the CDC spokesman said.

The Cyberdata supervisor console allows the data entry supervisor to communicate with the system to check job status and workload, CDC said.

The user can program the Cyberdata system in Owncode, an Assembly-type language. However, CDC expects to release a higher level language next March, the spokesman said.

The Cyberdata is not intended as a distributed data base system and does not provide for on-line file updating, the spokesman said.

Basic Equipment

The basic Cyberdata system uses a 56K CDC System 17 processor, has a cartridge disk drive offering 8.8K bytes; a 7- or 9-track, 1,600 bit/in. tape drive; a supervisor console controller; and eight key-entry stations.

The system can have a maximum of four 128K cartridge disk drives, four tape drives, eight controllers and 63 CRTs.

CRTs are available with either 32-character or 480-character displays. Both types feature IBM 029-type keyboards.

A cluster of up to eight remote keystations can communicate with the Cyberdata host through a CDC 970-26 controller which multiplexes the data for synchronous transmission at up to 9,600 bit/sec.

Single, remote keystations can be linked to the Cyberdata systems with a Bell 103-type modem over dial-up lines.

Optional peripherals include a 300 card/min reader. Both 300- and 1,200 line/min printers are available.



The Cyberdata system, previously introduced in Europe, is Control Data Corp.'s first entry in the key-to-disk arena. A forthcoming enhancement will allow it to support both key-entry and optical character recognition (OCR) processing at the same time.

The CDC 929 OCR document reader processes original documents and single sheets and cards with a maximum throughput of 1,200 document/min.

The CDC 959 OCR document page reader accepts typewritten, handwritten or computer-generated source documents in the form of pages, separated fanfolds, small forms or cards or journal tapes.

Throughput is said to be 720 full page/hour or 18,000 small document/hour.

The monthly lease price of a typical Cyberdata system with 14 key-entry stations comes to $2,914, maintenance included, on CDC's commercial term plan. Purchase arrangements are also available, and delivery to U.S. customers is immediate, CDC said.

Users With Independents' DBMS Happier Than Those With IMS

(Continued from Page 1)

the scattered returns on a broad range of packages users considered DBMS were not analyzed.

Averaging a mass of answers can lead to some perhaps unwarranted results or to a suspicion the results are mathematically accurate, but meaningless.

It is interesting, therefore, to note the majority of the package ratings for both Total and IMS were in the "good" category. For both Adabas and System 2000, most package votes were "excellent."

The same pattern held in vendor support ratings, but the Total users weren't quite as consistent in this voting. "Good" was the heaviest single category, but that vote tally made up only a plurality of the ballots.

Many readers asked for comparisons of the technical features of the various DBMS. Time and space seem to rule out fulfilling that request in detail, but several of the ballots indicated the users were using two DBMS and were willing to make comparative evaluations.

One reader, for example, noted after working with both Burroughs' DMS-II and IBM's IMS: "It takes twice as long with people of a higher skill level to bring up an IMS system than a Burroughs."

Another user, with Total and System 2000, rated both as having "good" capabilities, but differentiated in the vendor support, ranking Total's backing as "good," System 2000's as "average."

A third user, with four years of experience on IMS and ".75 years" with Honeywell's IDS, rated the IBM product and support as "excellent," the Honeywell product and support as "average."

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Bad Taste — Not Fraud — Ruled In Offer to Sell Credit Records

By Ronald A. Frank
Of the CW Staff

NASHUA, N.H. – A letter from a credit bureau offering to sell consumers a copy of their credit records for $7.50 may have been in bad taste, but it did not constitute fraud.

That was the finding of the Hillsborough County Superior Court concerning a letter sent to consumers by the Credit Bureau of Nashua, Inc. [CW, June 18].

While the letter, sent to 60,000 area residents, was "in very poor taste," it did not constitute a case of fraud or misrepresentation, according to Justice Martin F. Loughlin. Statements from the credit bureau, however, indicate the letter may have been designed to test credit-reporting laws.

The court ruling marked the second defeat in the case for the Consumer Protection Division of the New Hampshire Office of the Attorney General. The state agency had acted after it received numerous complaints from recipients of the letter.

The complaints objected to the statement that "we have decided to give you a chance to obtain sole possession of your complete file before it becomes part of a large computerized data bank, which may allow unlimited access by thousands of people."

Challenged on Two Counts

The Consumer Protection Division went to Superior Court and challenged the credit bureau on two counts. First, the division alleged, the credit bureau could not sell its files without notifying the affected consumers and gaining their consent; this is a requirement of the New Hampshire Fair Credit-Reporting Act, the division said.

Second, the attorney general's office alleged the letter contained misrepresentations which should be corrected with a second letter. The court was also asked to order the money paid by consumers to obtain copies of their files be refunded.

The Superior Court granted an injunction against the credit bureau, but this was later lifted when Loughlin ruled the credit bureau had the right to sell its files under the state Fair Credit-Reporting Act.

The Consumer Protection Division appealed to the New Hampshire Supreme Court, but the higher court said it agreed with the original finding.

Most recently, the Superior Court again ruled against the Consumer Protection Division, this time on the count of misrepresentation. Loughlin said it was understandable many consumers had complained about the wording of the letter, but there was no fraud involved.

'Court Erred'

"We believe the court erred and we intend to appeal the decision," Richard Wiebusch, assistant attorney general and chief of the Consumer Protection Division, said.

It will be up to the Superior Court whether the appeal will go to the state's highest court, and such a step appears probable, he added.

While the injunction was pending, the credit bureau refunded the $7.50 sent by many consumers who had received the letter. Those who paid the fee to obtain "sole possession" of their files were told 15 days would be required "for processing."

Originally, Wesley Pike, owner of the credit bureau had planned to close down the credit operation. He reportedly had rejected an offer to sell his credit files to a national credit-reporting service.

The letter was sent to consumers at the end of May and, on June 15, the Credit Bureau of Nashua said it would end its credit operation. After the recent court decision, however, the attorney for the credit bureau, Joseph Kerrigan, said the credit operation had resumed.

The credit bureau has survived an "unsuccessful legal assault" and has terminated its negotiations to sell the credit files, Kerrigan said. He indicated the letter and the subsequent legal proceedings had been purposely planned to test the legal rights of the credit bureau.

Wiebusch said his office still has the case under active consideration and added the Consumer Protection Division will take whatever steps are required to protect the interests of the public.

No date has been set on further Superior Court consideration of the appeal by the Attorney General's office.

DP Dunning of Consumers To End Next Month

WASHINGTON, D.C. – DP departments of companies that extend credit to consumers will have to develop ways to resolve billing disputes with their customers by next month.

Repeated dunning of customers with computer-generated overdue notices will no longer be permitted under regulations issued recently by the Federal Reserve Board.

The regulations were issued to implement the Fair Credit Billing Act, which becomes effective Oct. 28 [CW, April 9].

Under the rules, a creditor must acknowledge a written inquiry from a customer within 30 days and resolve the dispute within 90 days.

During this period, the customer does not have to pay any disputed bills and the creditor cannot try to collect the amount in dispute or any finance charges on it. Further, the customer's account cannot be closed.

Creditors who fail to comply will be subject to forfeiture of the disputed amount, up to $50, regardless of whether an error was made.

Creditors must advise credit users how and where to file a claim for a billing error in the first normal billing cycle after Oct. 28.

This information must be sent at least twice a year, or an abbreviated version may be sent with monthly billings, the regulations said.

DP departments have been granted a six-month transition period in which to print forms or effect systems changes.

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Users Report SMF Inadequate as Measurement Tool

(Continued from Page 1)

twice as high as that of Syncsort.

That situation came to light with a program Moore wrote to "consume and count" all available CPU cycles in the system. The hardware monitoring indicated clearly that SMF faithfully records all of a user's problem state cycles, but misses much of the time used by the system itself.

Prior to each evaluation, SMF data was analyzed in order to determine the sorting characteristics at the particular installation. The analysis was done with a program built for the purpose by Whitlow, the Syncsort vendor. Each center then selected from its own libraries, the files which seemed closest to its typical characteristics.

At the end of the tests, FNSB found that while SMF indicated an 8.6% reduction of CPU utilization by SM1-5740 compared with SM1-5734 (another IBM sort), the hardware monitor indicated a 5.3% increase in true CPU time.

At Transamerica, SMF indicated an 8.6% increase of CPU utilization by Syncsort vs. SM1-5734, but the monitor showed a 25.1% reduction in true total CPU time.

At Donnelly, the hardware monitor logged a 43.1% reduction in true total CPU time when Syncsort was used rather than SM1-5740. SMF, working with exactly the same files and the same sort packages, showed only a 24.9% reduction.

Lower I/O Aetivity

In related tests on other parts of the system used during sorting operations, Whitlow and the users found a general trend to lower I/O activity as EXCPs were reduced – generally by increasing file block sizes. But the reduction in true I/O activity – device busy time or channel time – was "far from proportional to the reduction of EXCPs," Whitlow noted.

The device busy time consists of three components: seek time – as the disk arm moves; latency – turn of the disk once the arm is in position; and data transfer time. True utilization of I/O resources has a complex dependency not only on the number of EXCPs issued, but also on what is involved with each EXCP.

A few transfers of long data blocks may take a much longer time than numerous transfers of smaller data blocks, Whitlow noted.

Tests at FNSB indicated SM1-5740's device busy time compared with that of SM1-5734 increased by 18.9% in multiprogramming which indicated, according to Whitlow, "the unsuitability of SM1-5740's sorting technique [the so-called Peer sort] to multiprogramming" environments.

By contrast, the vendor noted with some pride, Syncsort improved its device busy time by 21% when executing in multiprogramming situations.

A 45-page report documenting the findings at the three sites is available free from Whitlow Computer Systems, 222 South Marginal Road, 07024.

U.S. May Use Xerox Exit Data

(Continued from Page 1)

Depositions and IBM documents will not play as significant a role during these next weeks as they did in the first seven weeks of the trial, but third-party documents such as those from Honeywell will be dealt with during testimony, Carlson noted.

The parties issued a joint progress report to the court; however, this was described by a spokesman for the judge as "an internal document that will not be filed" and therefore will be unavailable to the public.

Remarks made during the hearing, though, indicated progress has been made concerning the legibility of the IBM documents the government will enter into evidence over the next few months.

A senior member of the Justice Department team, Joseph Widmar, reported 350 documents are ready to be marked and put into evidence. Another 100 to 200 are in various stages of reconstruction and reproduction, he said.

The parties are also on the verge of agreeing to a stipulation of the titles and positions of IBM officials and employees and to a joint statement of issues in the case.

IBM and the government have yet to settle on whether the Telex record will be accepted in whole or in part. IBM said it will agree to incorporate the entire Telex record into the record of this case to save both the court and counsel time.

"To do otherwise would be to waste time discussing issues that aren't really controversial," Thomas D. Barr, lead IBM attorney from Cravath, Swain and Moore, said.

He suggested the reason no progress had been made on such an agreement was that Carlson had not taken time to deal with the subject. Carlson responded that he only took exception to some stipulations of fact in the Telex record and that he would weed these out so the rest of the record could be incorporated.

IBM Dragging Feet

In its turn, IBM dragged its feet on accepting the record in this case to prevent a mistrial if anything happens to the judge.

Barr said he was willing to discuss accepting the record in segments as the case progresses, but he would not waive his client's potential right to another trial.

Edelstein commented he plans "to do everything I can through appropriate channels" to make such agreements a matter of legislative course.

Despite his concern, Edelstein exhibited a greater sense of humor on the state of his health than he has in the past.

"I underwent a complete physical examination for the first time in five or six years," the judge said. "You gentlemen have accomplished what my wife couldn't.

"The doctor didn't prescribe any drugs, but he did give me a hefty bill. As a matter of fact, that was the first sick moment I've had."

Correction

The names under the photos of Ron Huch and Hank Weiss of Centronics Data Computer Corp. were inadvertently switched [CW, Sept. 17].

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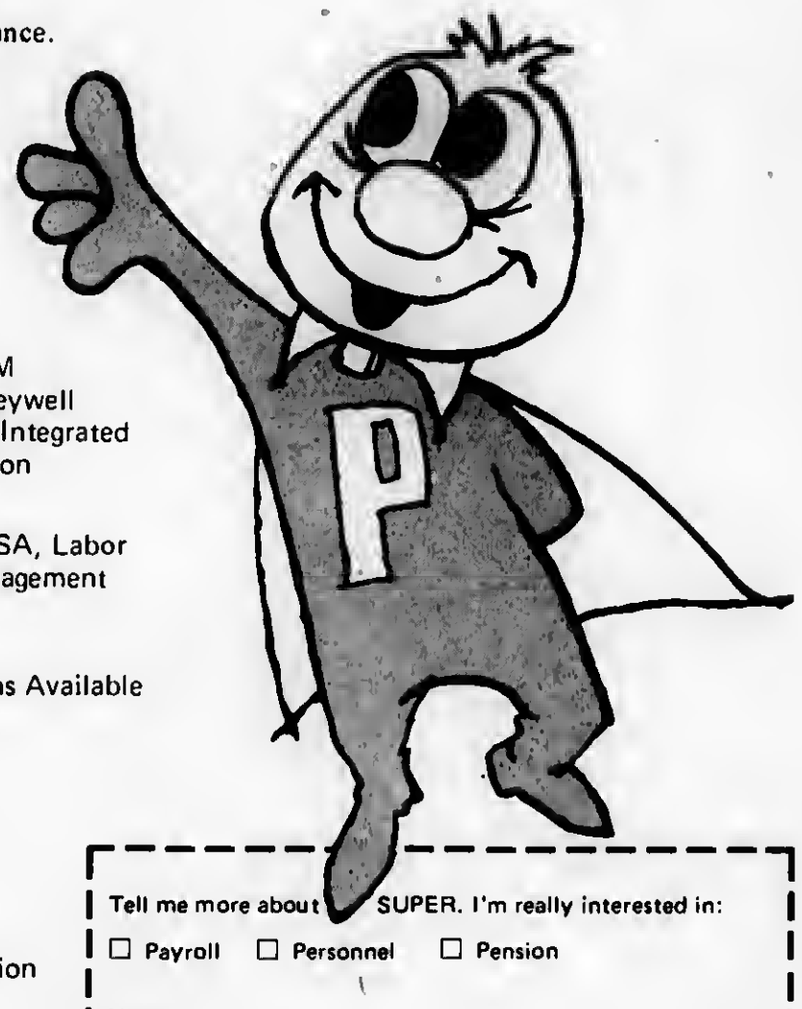
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CW924

Standardizes Efforts

Program Generator Cuts Firm's Staff

By Edith Holmes
Of the CW Staff

NEW YORK — By using a high-level language program generator, an apparel manufacturer has minimized its DP staffing requirements and standardized its programming effort.

Nearly 100% of the programs used by I.C. Isaacs & Co. have the results of the program generator at their nucleus, according to Robert E. Kallstrom, DP director of the firm, which makes some five million pairs of slacks each year and is based in Baltimore, Md.

"Programmers are relieved of all mundane tasks and can concentrate on tricky logic problems," Kallstrom told an audience at Info 75 here recently. "And the package itself costs less than one programmer."

Requiring no more memory than the system's Cobol compiler, the program generator from Programming Methods, Inc., a division of GTE Information Systems, Inc., is called Score and runs on I.C. Isaacs' rented Univac 70/45 which operates in 360 emulation.

"We selected Score rather than a report writer, a data base manager or a file management package because the program generator creates good Cobol source programs from many available parameters," he said. In addition, Score permitted the firm to standardize data names. The program operates with such procedural names as "get-master."

Generates Programs

More than a report writer, Score can be used with up to eight files to generate programs, Kallstrom said. Fields can be rearranged, records reformatted and hash totals generated, he added. Score also has file and test data generation capabilities as well.

And the program generator can be used on any other system so long as there is a Cobol compiler. As I.C. Isaacs is going to a Univac 90/30 soon, this kind of flexibility was an important consideration in selecting Score, Kallstrom said.

He noted that, in addition to increasing programmer productivity, the program generator has eliminated the high cost of file management and reduced the time previously required to answer user requests.

Still another positive feature is the small amount of time needed to learn to use the generator. "A three-day training period is all that is required," Kallstrom said.

But, while the generator creates programs at a rapid rate and has decreased the need for several experienced programmers, the code turned out is generally less efficient than that written by programmers, he added.

"The effectiveness of the package is dramatic in terms of the number of lines generated, but that measure is misleading because everything turned out is not necessarily approved," Kallstrom said.

In trying to sell the system to users who remembered the firm's two previous, unsuccessful attempts to move from manual to automated inventory and account handling, the program generator had made special requests too easily answered, he added.

Two years after the system was installed, "users are so enthusiastic about it, the abundance of short-term requests sometimes interferes with long-range company projects," Kallstrom said.

"And when users come up with highly complex programs, they expect the same quick turnaround from the program generator and the DP staff that a much simpler project permits," he added.

But, given I.C. Isaacs' desire to show some results from the DP system early, to respond quickly to special requests and to build user and management confidence in an automated system, Kallstrom maintained the program generator is still an important part of the hardware, software and personnel mix needed to accomplish those goals.

NCIC 'Hit' Tags Attacker

EDWARDSVILLE, Ill. — A young woman, taken to a rural area of the Southern Illinois University campus here, assaulted and robbed, had little hope her assailant would be found. The only clues she could give police were a description of her attacker and his automobile.

A single traffic ticket, apparently dropped by the assailant at the crime scene, broke the case.

A check of the state's computerized drivers' licenses showed him to be a Chicago resident and possibly a university student.

Police entered the tag number into the Law Enforcement Agencies Data System and the National Crime Information Center (NCIC) as a felony vehicle.

Several days later, following a holdup, an officer of the Mooresville, Ind., police department apprehended a man driving the same vehicle and received a hit through NCIC.

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ACCJ E

NEWSPAPER

CW Looks at DBMS

Survey Shows Users Pleased With Systems

By Don Leavitt
Of the CW Staff

Current users of all the more popular data base management systems (DBMS) are generally happy, but users of DBMS from independent software houses tend to like their systems better than users of IBM's IMS like theirs.

Those conclusions were drawn from responses to a questionnaire run on *Computerworld's* editorial page last month [CW, Aug. 27]. Though based on data gathered separately, they confirmed conclusions of a Datapro Research Corp. survey published last October.

CW's survey asked two questions with quantifiable answers: "How would you rate the capabilities of your DBMS?" and "How would you rate vendor support?" CW provided four possible answers to each, ranging from "excellent" to "needs improvement."

Weighting responses on a four-point scale (with "excellent" valued at 4, and "needs improvement" valued at 1), Adabas from Software AG came up with the highest weighted averages. Fifteen Adabas users responded and graded their package capabilities at 3.73 and vendor support at 3.25.

System 2000 from MRI Systems Corp. garnered the next highest weighted average scores. Package capabilities were deemed better than good, at 3.27, and vendor support came in with an even higher score, 3.48.

'Total' Popularity

Cincom System's Total showed its popularity – industry estimates have pegged its installed user base at close to or larger than IBM's IMS base – with responses received from 66 users. Their combined opinion was that the package was worth 3.24 on the four-point scale, but vendor support slipped below the 3.0 of "good" to 2.76.

"Ballots" were received from another 66 users working with IBM data base systems – various versions of IMS, including the DL/I subset. Overall, they saw the software as worth 2.97 and vendor support worth 2.63.

Only five users of IDMS from Cullinane Corp. reported their evaluations – which were all in the "good" or "excellent" area – so weighted averages were not calculated for that DBMS. In similar fashion,

(Continued on Page 2)

CW Special Report On Data Base Management Systems Follows Page 28

In Measuring Performance

Three Users Find SMF Inadequate

By Don Leavitt
Of the CW Staff

FORT LEE, N.J. – IBM's System Management Facilities (SMF) is inadequate as a performance measurement tool, according to three separate studies.

IBM literature, however, describes SMF as an optional support function that "collects and records system information. The information obtained can be used in management . . . reports that describe system efficiency, performance and usage."

SMF has long been considered at least imprecise by a number of independent people concerned with computer performance evaluation. Now there is new evidence indicating just how inadequate SMF really is.

The evidence comes from studies conducted recently at three separate users' installations. In each case the study was geared to evaluation of IBM's and an independent vendor's sort package, and each utilized a hardware monitor to get what were finally considered accurate measurements.

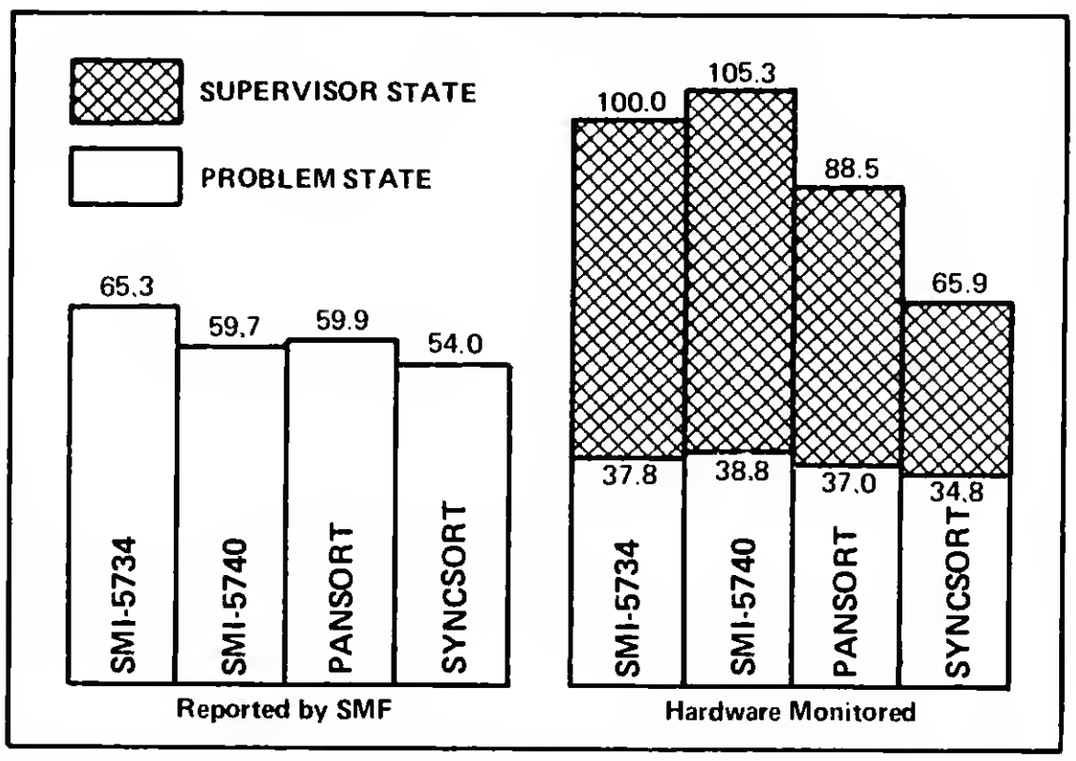
The users involved were the R.H. Donnelly Corp. of Des Moines, Iowa; Transamerica Information Services, Los Angeles; and First National State Bank (FNSB) of New Jersey, Newark, N.J.

Each evaluated Syncsort from Whitlow Computer Systems, Inc. and one or more of IBM's sorts. FNSB also evaluated Pansort from Pansophic Systems.

Transamerica has its own hardware monitor permanently attached to its CPU and uses it for system tuning as well as evaluations of new products. A Tesdata 1020-D hardware monitor – the little Microsum – was leased especially for the tests at Donnelly and, apparently, at FNSB as well.

Scott Moore of Donnelly was the first of the three users to become concerned about SMF during the sort evaluations. He found SMF recorded equal CPU utilization by both Syncsort and IBM's SM1-5740 in handling one of the company's typical sorts, but supervisor state CPU time of SM1-5740 appeared to be

(Continued on Page 4)



Using the hardware-monitored CPU time – supervisor state plus problem state – of IBM's SM1-5734 as a norm, First National State Bank of New Jersey compiled these comparisons. The SMF data (left) lumped supervisor and problem state times together. The hardware monitor data differentiated and identified far more supervisor time than SMF was able to log.

U.S. May Use Xerox Data in IBM Case

By Edith Holmes
Of the CW Staff

NEW YORK – In response to a subpoena, Xerox Corp. shipped 5,000 pages of documents dealing with its decision to leave the computer industry to the Department of Justice last Wednesday.

The government plans to explore the Xerox exit for possible use in its antitrust suit against IBM, Raymond M. Carlson, lead attorney for the U.S., told Judge David N. Edelstein, the sole arbiter in the case, during an in-trial hearing held here last week.

While the trial is scheduled to reconvene Monday, Sept. 22, following a two month recess, Carlson said there will be time in the weeks ahead to discuss the Xerox exit.

His staff will review the documents sent by Xerox and then discuss with IBM counsel those which the government will enter as evidence in its case, he said.

Trying charges that IBM monopolized the general-purpose computer systems market from the early 1960s to the early 1970s, U.S. vs. IBM recessed in the middle of July to give both parties time to complete discovery and depositions relating to the so-called "new issues" – charges that IBM monopolized the peripherals and leasing markets of the industry.

On the Docket

The government will reopen its case with the continuation of the market definition aspects of the suit. Beginning this week with James H. Binger, chairman of the Executive Committee of Honeywell, and Clarence W. Spangel, executive vice-president of Honeywell, several industry witnesses will take the stand in the next few weeks.

William C. Norris, chief executive officer and president of Control Data Corp., will follow Binger and Spangle if he returns in time from a visit with the Israeli prime minister.

The government expects to have some changes in those areas of its witness list relating to peripherals, the Xerox documents just received and some financial aspects of the case developed this summer, Carlson said.

(Continued on Page 4)

CDC Takes Plunge to Key-to-Disk With 'Distributed Data Entry' Unit

By Patrick Ward
Of the CW Staff

MINNEAPOLIS – Control Data Corp. has entered the key-to-disk arena with a "distributed data entry" product CDC said can handle up to 63 local or remote keystations.

The system, called Cyberdata, allows large users to replace five or six small, separate key-to-disk systems with two of the larger Cyberdata systems, a CDC spokesman said.

The CDC product can also support just one or two keystations in remote areas where that is all the capacity needed, he said.

The Cyberdata system will be able to offer further hardware consolidation next March when CDC adapts it to concurrently drive CDC optical character recognition (OCR) equipment in the background area while data entry continues in the foreground, the vendor said.

Currently available Cyberdata systems can handle OCR separately, permitting a user to do key entry during the day and then use the system's processor to run an OCR device at night, the CDC spokesman said.

The Cyberdata system currently cannot transmit batch data to a host computer. However, CDC said it will offer IBM 3780-compatible transmission capability in November, and early next year a CDC-compatible line protocol will be

(Continued on Page 2)

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CDC Takes Dive Into Key-to-Disk Waters

(Continued from Page 1)
available, the firm said.

A concurrent tape-to-print capability will also be offered as a major Cyberdata enhancement set for next March, the CDC spokesman added.

Introduced 'Too Soon'

CDC originally introduced the Cyberdata system in Europe two years ago. That was "too soon," and led to some problems, the spokesman said.

The North American version is an enhanced and time-tested unit, he added.

Like other key-to-disk systems, the Cyberdata system formats and edits keyed data. The system signals an operator when its error or range checks find a discrepancy.

The data entry supervisor can create formats by keying them onto the screen, the CDC spokesman said.

The Cyberdata supervisor console allows the data entry supervisor to communicate with the system to check job status and workload, CDC said.

The user can program the Cyberdata system in Owncode, an Assembly-type language. However, CDC expects to release a higher level language next March, the spokesman said.

The Cyberdata is not intended as a distributed data base system and does not provide for on-line file updating, the spokesman said.

Basic Equipment

The basic Cyberdata system uses a 56K CDC System 17 processor, has a cartridge disk drive offering 8.8K bytes; a 7- or 9-track, 1,600 bit/in. tape drive; a supervisor console controller; and eight key-entry stations.

The system can have a maximum of four 128K cartridge disk drives, four tape drives, eight controllers and 63 CRTs.

CRTs are available with either 32-character or 480-character displays. Both types feature IBM 029-type keyboards.

A cluster of up to eight remote keystations can communicate with the Cyberdata host through a CDC 970-26 controller which multiplexes the data for synchronous transmission at up to 9,600 bit/sec.

Single, remote keystations can be linked to the Cyberdata systems with a Bell 103-type modem over dial-up lines.

Optional peripherals include a 300 card/min reader. Both 300- and 1,200 line/min printers are available.



The Cyberdata system, previously introduced in Europe, is Control Data Corp.'s first entry in the key-to-disk arena. A forthcoming enhancement will allow it to support both key-entry and optical character recognition (OCR) processing at the same time.

The CDC 929 OCR document reader processes original documents and single sheets and cards with a maximum throughput of 1,200 document/min.

The CDC 959 OCR document page reader accepts typewritten, handwritten or computer-generated source documents in the form of pages, separated fanfolds, small forms or cards or journal tapes.

Throughput is said to be 720 full page/hour or 18,000 small document/hour.

The monthly lease price of a typical Cyberdata system with 14 key-entry stations comes to $2,914, maintenance included, on CDC's commercial term plan. Purchase arrangements are also available, and delivery to U.S. customers is immediate, CDC said.

Users With Independents' DBMS Happier Than Those With IMS

(Continued from Page 1)
the scattered returns on a broad range of packages users considered DBMS were not analyzed.

Averaging a mass of answers can lead to some perhaps unwarranted results or to a suspicion the results are mathematically accurate, but meaningless.

It is interesting, therefore, to note the majority of the package ratings for both Total and IMS were in the "good" category. For both Adabas and System 2000, most package votes were "excellent."

The same pattern held in vendor support ratings, but the Total users weren't quite as consistent in this voting. "Good" was the heaviest single category, but that vote tally made up only a plurality of the ballots.

Many readers asked for comparisons of the technical features of the various DBMS. Time and space seem to rule out fulfilling that request in detail, but several of the ballots indicated the users were using two DBMS and were willing to make comparative evaluations.

One reader, for example, noted after working with both Burroughs' DMS-II and IBM's IMS: "It takes twice as long with people of a higher skill level to bring up an IMS system than a Burroughs."

Another user, with Total and System 2000, rated both as having "good" capabilities, but differentiated in the vendor support, ranking Total's backing as "good," System 2000's as "average."

A third user, with four years of experience on IMS and ".75 years" with Honeywell's IDS, rated the IBM product and support as "excellent," the Honeywell product and support as "average."

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Bad Taste — Not Fraud — Ruled In Offer to Sell Credit Records

By Ronald A. Frank
Of the CW Staff

NASHUA, N.H. – A letter from a credit bureau offering to sell consumers a copy of their credit records for $7.50 may have been in bad taste, but it did not constitute fraud.

That was the finding of the Hillsborough County Superior Court concerning a letter sent to consumers by the Credit Bureau of Nashua, Inc. [CW, June 18].

While the letter, sent to 60,000 area residents, was "in very poor taste," it did not constitute a case of fraud or misrepresentation, according to Justice Martin F. Loughlin. Statements from the credit bureau, however, indicate the letter may have been designed to test credit-reporting laws.

The court ruling marked the second defeat in the case for the Consumer Protection Division of the New Hampshire Office of the Attorney General. The state agency had acted after it received numerous complaints from recipients of the letter.

The complaints objected to the statement that "we have decided to give you a chance to obtain sole possession of your complete file before it becomes part of a large computerized data bank, which may allow unlimited access by thousands of people."

Challenged on Two Counts

The Consumer Protection Division went to Superior Court and challenged the credit bureau on two counts. First, the division alleged, the credit bureau could not sell its files without notifying the affected consumers and gaining their consent; this is a requirement of the New Hampshire Fair Credit-Reporting Act, the division said.

Second, the attorney general's office alleged the letter contained misrepresentations which should be corrected with a second letter. The court was also asked to order the money paid by consumers to obtain copies of their files be refunded.

The Superior Court granted an injunction against the credit bureau, but this was later lifted when Loughlin ruled the credit bureau had the right to sell its files under the state Fair Credit-Reporting Act.

The Consumer Protection Division appealed to the New Hampshire Supreme Court, but the higher court said it agreed with the original finding.

Most recently, the Superior Court again ruled against the Consumer Protection Division, this time on the count of misrepresentation. Loughlin said it was understandable many consumers had complained about the wording of the letter, but there was no fraud involved.

'Court Erred'

"We believe the court erred and we intend to appeal the decision," Richard Wiebusch, assistant attorney general and chief of the Consumer Protection Division, said.

It will be up to the Superior Court whether the appeal will go to the state's highest court, and such a step appears probable, he added.

While the injunction was pending, the credit bureau refunded the $7.50 sent by many consumers who had received the letter. Those who paid the fee to obtain "sole possession" of their files were told 15 days would be required "for processing."

Originally, Wesley Pike, owner of the credit bureau had planned to close down the credit operation. He reportedly had rejected an offer to sell his credit files to a national credit-reporting service.

The letter was sent to consumers at the end of May and, on June 15, the Credit Bureau of Nashua said it would end its credit operation. After the recent court decision, however, the attorney for the credit bureau, Joseph Kerrigan, said the credit operation had resumed.

The credit bureau has survived an "unsuccessful legal assault" and has terminated its negotiations to sell the credit files, Kerrigan said. He indicated the letter and the subsequent legal proceedings had been purposely planned to test the legal rights of the credit bureau.

Wiebusch said his office still has the case under active consideration and added the Consumer Protection Division will take whatever steps are required to protect the interests of the public.

No date has been set on further Superior Court consideration of the appeal by the Attorney General's office.

DP Dunning of Consumers To End Next Month

WASHINGTON, D.C. – DP departments of companies that extend credit to consumers will have to develop ways to resolve billing disputes with their customers by next month.

Repeated dunning of customers with computer-generated overdue notices will no longer be permitted under regulations issued recently by the Federal Reserve Board.

The regulations were issued to implement the Fair Credit Billing Act, which becomes effectivc Oct. 28 [CW, April 9].

Under the rules, a creditor must acknowledge a written inquiry from a customer within 30 days and resolve the dispute within 90 days.

During this period, the customer does not have to pay any disputed bills and the creditor cannot try to collect the amount in dispute or any finance charges on it. Further, the customer's account cannot be closed.

Creditors who fail to comply will be subject to forfeiture of the disputed amount, up to $50, regardless of whether an error was made.

Creditors must advise credit users how and where to file a claim for a billing error in the first normal billing cycle after Oct. 28.

This information must be sent at least twice a year, or an abbreviated version may be sent with monthly billings, the regulations said.

DP departments have been granted a six-month transition period in which to print forms or effect systems changes.

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Users Report SMF Inadequate as Measurement Tool

(Continued from Page 1)

twice as high as that of Syncsort.

That situation came to light with a program Moore wrote to "consume and count" all available CPU cycles in the system. The hardware monitoring indicated clearly that SMF faithfully records all of a user's problem state cycles, but misses much of the time used by the system itself.

Prior to each evaluation, SMF data was analyzed in order to determine the sorting characteristics at the particular installation. The analysis was done with a program built for the purpose by Whitlow, the Syncsort vendor. Each center then selected from its own libraries, the files which seemed closest to its typical characteristics.

At the end of the tests, FNSB found that while SMF indicated an 8.6% reduction of CPU utilization by SM1-5740 compared with SM1-5734 (another IBM sort), the hardware monitor indicated a 5.3% increase in true CPU time.

At Transamerica, SMF indicated an 8.6% increase of CPU utilization by Syncsort vs. SM1-5734, but the monitor showed a 25.1% reduction in true total CPU time.

At Donnelly, the hardware monitor logged a 43.1% reduction in true total CPU time when Syncsort was used rather than SM1-5740. SMF, working with exactly the same files and the same sort packages, showed only a 24.9% reduction.

Lower I/O Activity

In related tests on other parts of the system used during sorting operations, Whitlow and the users found a general trend to lower I/O activity as EXCPs were reduced – generally by increasing file block sizes. But the reduction in true I/O activity – device busy time or channel time – was "far from proportional to the reduction of EXCPs," Whitlow noted.

The device busy time consists of three components: seek time – as the disk arm moves; latency – turn of the disk once the arm is in position; and data transfer time. True utilization of I/O resources has a complex dependency not only on the number of EXCPs issued, but also on what is involved with each EXCP.

A few transfers of long data blocks may take a much longer time than numerous transfers of smaller data blocks, Whitlow noted.

Tests at FNSB indicated SM1-5740's device busy time compared with that of SM1-5734 increased by 18.9% in multiprogramming which indicated, according to Whitlow, "the unsuitability of SM1-5740's sorting technique [the so-called Peer. sort] to multiprogramming" environments.

By contrast, the vendor noted with some pride, Syncsort improved its device busy time by 21% when executing in multiprogramming situations.

A 45-page report documenting the findings at the three sites is available free from Whitlow Computer Systems, 222 South Marginal Road, 07024.

U.S. May Use Xerox Exit Data

(Continued from Page 1)

Depositions and IBM documents will not play as significant a role during these next weeks as they did in the first seven weeks of the trial, but third-party documents such as those from Honeywell will be dealt with during testimony, Carlson noted.

The parties issued a joint progress report to the court; however, this was described by a spokesman for the judge as "an internal document that will not be filed" and therefore will be unavailable to the public.

Remarks made during the hearing, though, indicated progress has been made concerning the legibility of the IBM documents the government will enter into evidence over the next few months.

A senior member of the Justice Department team, Joseph Widmar, reported 350 documents are ready to be marked and put into evidence. Another 100 to 200 are in various stages of reconstruction and reproduction, he said.

The parties are also on the verge of agreeing to a stipulation of the titles and positions of IBM officials and employees and to a joint statement of issues in the case.

IBM and the government have yet to settle on whether the Telex record will be accepted in whole or in part. IBM said it will agree to incorporate the entire Telex record into the record of this case to save both the court and counsel time.

"To do otherwise would be to waste time discussing issues that aren't really controversial," Thomas D. Barr, lead IBM attorney from Cravath, Swain and Moore, said.

He suggested the reason no progress had been made on such an agreement was that Carlson had not taken time to deal with the subject. Carlson responded that he only took exception to some stipulations of fact in the Telex record and that he would weed these out so the rest of the record could be incorporated.

IBM Dragging Feet

In its turn, IBM dragged its feet on accepting the record in this case to prevent a mistrial if anything happens to the judge.

Barr said he was willing to discuss accepting the record in segments as the case progresses, but he would not waive his client's potential right to another trial.

Edelstein commented he plans "to do everything I can through appropriate channels" to make such agreements a matter of legislative course.

Despite his concern, Edelstein exhibited a greater sense of humor on the state of his health than he has in the past.

"I underwent a complete physical examination for the first time in five or six years," the judge said. "You gentlemen have accomplished what my wife couldn't.

"The doctor didn't prescribe any drugs, but he did give me a hefty bill. As a matter of fact, that was the first sick moment I've had."

Correction

The names under the photos of Ron Huch and Hank Weiss of Centronics Data Computer Corp. were inadvertently switched [CW, Sept. 17].

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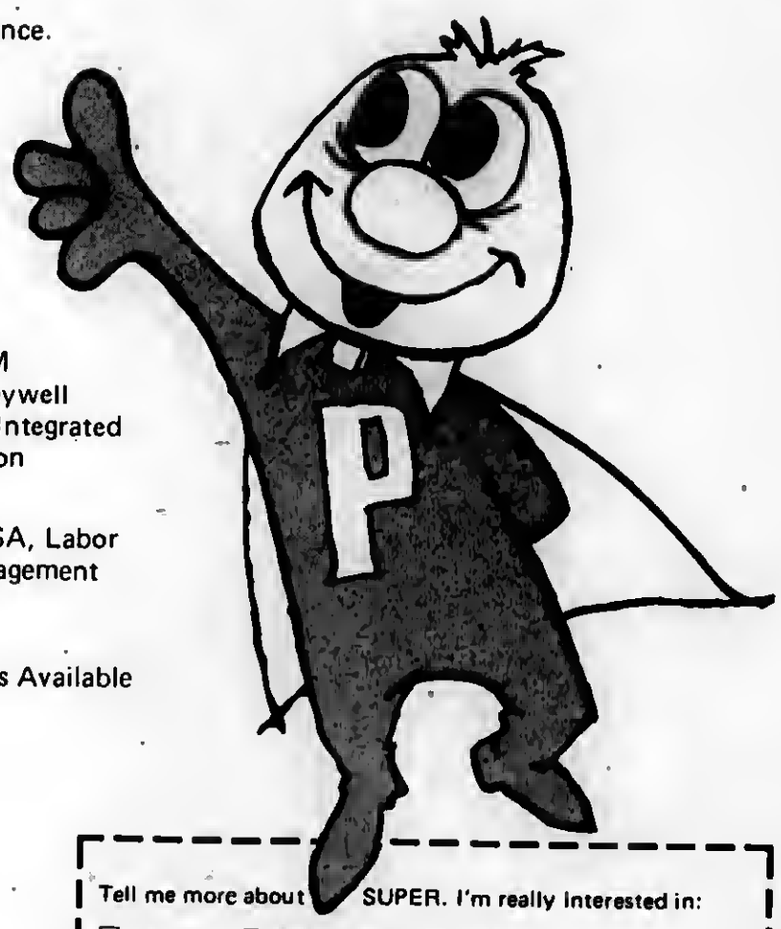
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Standardizes Efforts

Program Generator Cuts Firm's Staff

By Edith Holmes
Of the CW Staff

NEW YORK – By using a high-level language program generator, an apparel manufacturer has minimized its DP staffing requirements and standardized its programming effort.

Nearly 100% of the programs used by I.C. Isaacs & Co. have the results of the program generator at their nucleus, according to Robert E. Kallstrom, DP director of the firm, which makes some five million pairs of slacks each year and is based in Baltimore, Md.

"Programmers are relieved of all mundane tasks and can concentrate on tricky logic problems," Kallstrom told an audience at Info 75 here recently. "And the package itself costs less than one programmer."

Requiring no more memory than the system's Cobol compiler, the program generator from Programming Methods, Inc., a division of GTE Information Systems, Inc., is called Score and runs on I.C. Isaacs' rented Univac 70/45 which operates in 360 emulation.

"We selected Score rather than a report writer, a data base manager or a file management package because the program generator creates good Cobol source programs from many available parameters," he said. In addition, Score permitted the firm to standardize data names. The program operates with such procedural names as "get-master."

Generates Programs

More than a report writer, Score can be used with up to eight files to generate programs, Kallstrom said. Fields can be rearranged, records reformatted and hash totals generated, he added. Score also has file and test data generation capabilities as well.

And the program generator can be used on any other system so long as there is a Cobol compiler. As I.C. Isaacs is going to a Univac 90/30 soon, this kind of flexibility was an important consideration in selecting Score, Kallstrom said.

He noted that, in addition to increasing programmer productivity, the program generator has eliminated the high cost of file management and reduced the time previously required to answer user requests.

Still another positive feature is the small amount of time needed to learn to use the generator. "A three-day training period is all that is required," Kallstrom said.

But, while the generator creates programs at a rapid rate and has decreased the need for several experienced programmers, the code turned out is generally less efficient than that written by programmers, he added.

"The effectiveness of the package is dramatic in terms of the number of lines generated, but that measure is misleading because everything turned out is not necessarily approved," Kallstrom said.

In trying to sell the system to users who remembered the firm's two previous, unsuccessful attempts to move from manual to automated inventory and account handling, the program generator had made special requests too easily answered, he added.

Two years after the system was installed, "users are so enthusiastic about it, the abundance of short-term requests sometimes interferes with long-range company projects," Kallstrom said.

"And when users come up with highly complex programs, they expect the same quick turnaround from the program generator and the DP staff that a much simpler project permits," he added.

But, given I.C. Isaacs' desire to show some results from the DP system early, to respond quickly to special requests and to build user and management confidence in an automated system, Kallstrom maintained the program generator is still an important part of the hardware, software and personnel mix needed to accomplish those goals.

NCIC 'Hit' Tags Attacker

EDWARDSVILLE, Ill. – A young woman, taken to a rural area of the Southern Illinois University campus here, assaulted and robbed, had little hope her assailant would be found. The only clues she could give police were a description of her attacker and his automobile.

A single traffic ticket, apparently dropped by the assailant at the crime scene, broke the case.

A check of the state's computerized drivers' licenses showed him to be a Chicago resident and possibly a university student.

Police entered the tag number into the Law Enforcement Agencies Data System and the National Crime Information Center (NCIC) as a felony vehicle.

Several days later, following a holdup, an officer of the Mooresville, Ind., police department apprehended a man driving the same vehicle and received a hit through NCIC.

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Report Urges Center For DP in Chemistry

WASHINGTON, D.C. — An urgent need exists for more adequate computational resources in the field of chemistry, according to a recent National Academy of Sciences publication, "The Proposed National Resource for Computation in Chemistry: a User-Oriented Facility."

Comprehensive studies recently undertaken by the academy's National Research Council (NRC) suggested "a National Resource for Computation in Chemistry (NRCC) be organized as a user-oriented facitity, with hardware and personnel dedicated toward serving the needs of the broadest chemical community," the report said.

Such a resource "wilt be more cost-effective than a further increase in the apptication of computers as presently practiced and will contribute to the solution of important current national problems."

The NRCC, once established, will need "a computcr having the speed and memory of a [Control Data Corp.] 7600, an IBM 370/195 or their equivalent" to fulfill its function, the report said.

Copies of the report are available without charge from the Office of Chemistry and Chemical Technology, NCR, 2t01 Constitution Ave., 20418.

Virginia Joins CCH System, Brings Members to Seven

WASHINGTON, D.C. — The State of Virginia has started to enter computerized criminal history records in the Federal Bureau of Investigation's Computerized Criminal History (CCH) system.

This brings the number of CCH participants to seven. The others are Arizona, Ftorida, Illinois, Catifornia, Michigan and the District of Columbia.

Since the CCH data base began in November 1971, the number of computerized records it contains has grown to 649,785.

System 'Runs' Olympics

MOUNT PLEASANT, Mich. — Computerized Olympics? Not exactly, but a computer did play a major rote in running the International Special Olympics for mentally retarded athtetes here recently.

Bill Dunham, associate registrar at Central Michigan University, where the Olympics took place, began setting up registration for the event almost two years ago.

Registration forms were developed to obtain information ranging from events in which the children participated to medical and parental reteases.

Once entered into the university's Univac 1106, thc data was used to chart each individual's activity for the five days of competition.

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New Techniques' Chief Value Seen in Program Upkeep

By Edith Holmes
Of the CW Staff

NEW YORK – Improved programming technologies like structured programming and top-down development can increase the productivity of a shop by 50% at most, according to a senior systems analyst.

"But producing code faster is only part of the story," Linda Jones of Consolidated Edison Co. in New York said. "While there are no controlled studies as yet, estimates of program maintenance reduction when these programming techniques are used range from 50% to 80%."

Productivity improvements of up to 100% can be anticipated where interactive programming is used, Jones told attendees at the recent Info 75 here.

Why worry about productivity at all? Noting the amount of time DP operations must spend just to maintain their present equipment and software, Jones quoted an IBM study indicating most shops have a three-year backlog of applications they would like to implement.

To help solve this problem, Jones discussed the variety of programming productivity techniques available – most of which have been devised by IBM and, with one exception, are independent of hardware and software.

These techniques include chief programmer teams, structured design, hierarchical input processing output (Hipo) charts structured walk-throughs, structured coding and top-down development. She added interactive programming to the list as well.

All of these approaches are applicable in large and small installations and, ultimately, they work to discipline the programming process, Jones said.

Few installations have implemented the whole package of techniques, and Hipo, structured programming and top-down development are probably the most common, she added.

Chief Programmer Teams

A chief programmer team is headed by someone with 10 to 15 years of experience, according to Jones. With no management responsibility, the chief programmer is held accountable for the final product of the team, which consists of an assistant chief programmer, a program librarian and programmers.

In addition to improving programming efficiency, this approach provides a technical career path for programmers and promotes the education of the younger members of each team, Jones said.

"A disciplined method for achieving a reliable modular program," structured design depends on the strong binding of the elements within each module of a program and the weak coupling of these modules together in the program to minimize the effects of modification to specific modules.

Hipo is "ideal for expressing a structured design," according to Jones. "A Hipo chart provides the programmer with a visual table of contents or overview of the program, enabling him to code directly without the traditional flow charting that is often neither desirable nor necessary."

Structured walk-throughs are designed to find any and all errors in programs.

Walk-throughs should aim at analyzing the functional design of a program, discovering logic errors, eliminating coding errors and incorporating a testing strategy into the development process, Jones said.

They should be scheduled by the person whose work is to be reviewed, have no management participation, emphasize error detection and result in some "action list" for correcting program mistakes, she added.

Structured Coding

A fifth approach to improving programmer productivity is structured coding where each module has exactly one entry and one exit, Jones said. Three basic coding structures are used: sequence, IF THEN ELSE and DO WHILE or DO UNTIL, she said, adding that the case structure is "a useful extension of structured coding in the real world."

"Structured programs are highly readable and are easier to debug and test," she explained. "Instructions on one aspect of a program are all in one place – the familiar 'come from' problem is eliminated because there are no GO TOs."

Finally, Jones discussed top-down development, an approach in which the highest level code is written first. Lower level modules are then coded, integrated and tested one by one.

There is no need to write driver programs, she said, and, while a "stub" must be written for each lower level module, "these are simple enough for junior programmers or the program librarian to generate."

Though not part of the IBM package of productivity techniques, interactive programming provides "powerful editing and fix-up capabilities," according to Jones. This approach gives the programmer immediate feedback, interactive debug facilities and interpretive compilers, she said.

Development Costs Limit DP

NEW YORK – The high cost of application development is the principal factor limiting the extension of data processing, a panel of people concerned with this aspect of DP have agreed.

"Personnel are the most expensive element in the DP budget, and they spend most of their time developing applications," according to David A. Nelson, an independent consultant from Moorestown, N.J. and chairman of the session on improved technologies for applications development.

"Vendors have nearly as much at stake as do users – if there are no new applications, there will be fewer hardware demands and sales," he said at the recent Info 75.

The panelists agreed that, to make applications development more cost-effective, a shop can either improve the quality of its people through programming productivity techniques or decrease the level of skills required of its personnel by using such technical devices as a high-level language program generator.

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Charges of Discriminatory Specs Delay Ark. System

By Toni Wiseman
Of the CW Staff

LITTLE ROCK, Ark. – A charge of discriminatory specification has caused the indefinite postponement of bid openings for a state computer system here.

The postponement came after the state Information Systems Executive Committee (Isec), a cabinet-level group which must approve new or expanded computer systems for state agencies, received complaints that the bid was "very restrictive" and limited proposals to an IBM System/3 or its equivalent, according to Richard Heath, director of the state Finance and Administration Department.

The computer in question was for the Health Department, which has outgrown its IBM 360/20. The system would give the department added computing capability and allow it to interface with the state's central computing facility comprised of duplexed IBM 370/145s.

Isec received an outline of the originally proposed specifications which it approved, Heath said. The proposal was then sent to the Office of Purchasing where the invitation to bid was prepared.

"But there were certain things either put in or added during this whole process that basically made it turn out to be a bid for a System/3 or equivalent," Heath commented.

"That's not what we had in mind, so we pulled the bid down and redrafted it," he said.

A spokesman for the Purchasing Department, Ed Eudy, said the department had to rely on its users to provide fair specs for invitations to bid.

"Many times it's inadvertent, but many times there is a certain amount of bias and we can't catch it because the people who are on the administrative end of the thing simply are not familiar enough with computer equipment to be able to ascertain whether or not these people are writing exclusive bids," Eudy said.

"Many times what happens is that we end up with egg on our face and that's just the way it is," he added.

Vendor Complaints

Heath said he had received a verbal complaint from a Univac representative and had learned of a verbal complaint made by Burroughs charging the request for proposals (RFP) was discriminatory.

As a result of the complaints, "I personally got a copy of the invitation to bid and brought it up at the Isec meeting, as a result of which the bids were not opened," he said.

Twenty-one letters were received which, Heath said, he assumed were mainly bids, "though some of them may have been saying they declined to bid." The letters were returned unopened to the senders.

A revised RFP was drawn up by Gordon Stokes, a consultant hired by the state legislative committee, "changing some of the mandatory requirements just slightly so a substantially larger number of vendors would be able to bid," Heath said.

Eudy could not say exactly what changes had been made in the RFP but said it looked like a format change: "Certain portions of the equipment were not as well-defined."

When a piece of equipment is needed, Eudy noted, someone defines that equipment, on an agency level, in terms of the way the agency wants to use it.

In writing this proposal up, he may be schooled either by experience or by salesmen, he said.

"If it is by experience, then typically, within our state's system, the most prevalent form of computer equipment is manufactured by IBM," Eudy said.

There are now other companies besides IBM who can offer the same services, Eudy stated. "Perhaps the services may not incorporate the same type of equipment, but they do finally the same job.

"Now there is always the opportunity to bid an alternate," Eudy said. "However, many people within the industry feel reluctant to bid a completely different system for fear it may not be adequately reviewed."

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Need for Procedures Seen Major Effect Of 1974 Privacy Act

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – One of the major effects the Privacy Act of 1974 will have on government agencies is the establishment of administrative procedures, two government officials said here recently.

The Department of Health, Education and Welfare (HEW) has elected to consider itself as one agency, according to Lee Wouters, an analyst in the office of the secretary of the Office of Management Planning and Technology.

This will permit the transfer of records between the department's components, such as Social Security, Education, Social Rehabilitation Service, Public Health and the Office of Consumer Affairs, he said at this month's IEEE Computer Society conference.

HEW decided to centralize its planning functions for implementing the Privacy Act, and the administrative procedures will be performed on a decentralized basis, he explained.

In addition to transferring records, other advantages of HEW's central planning method are that it allows the secretary to guide implementation and should eliminate redundant efforts and provide flexibility of parts, Wouters said.

Also, one set of agency regulations was published in the *Federal Register*, he said, which simplified matters for other departments wishing to deal with any parts of HEW.

Publishing lists of the data banks it maintains, as required by the law, probably was more helpful to HEW than it was to the public, he observed.

HEW thinks it has cut through bureaucratic levels by allowing individuals who are dissatisfied with a decision made on the local level to add to his file to see an assistant secretary.

HEW is issuing a list of safeguards for security at DP sites and terminals, he said, and then the various departments will individually select the technology and administrative techniques, pending review by an assistant secretary, Wouters said.

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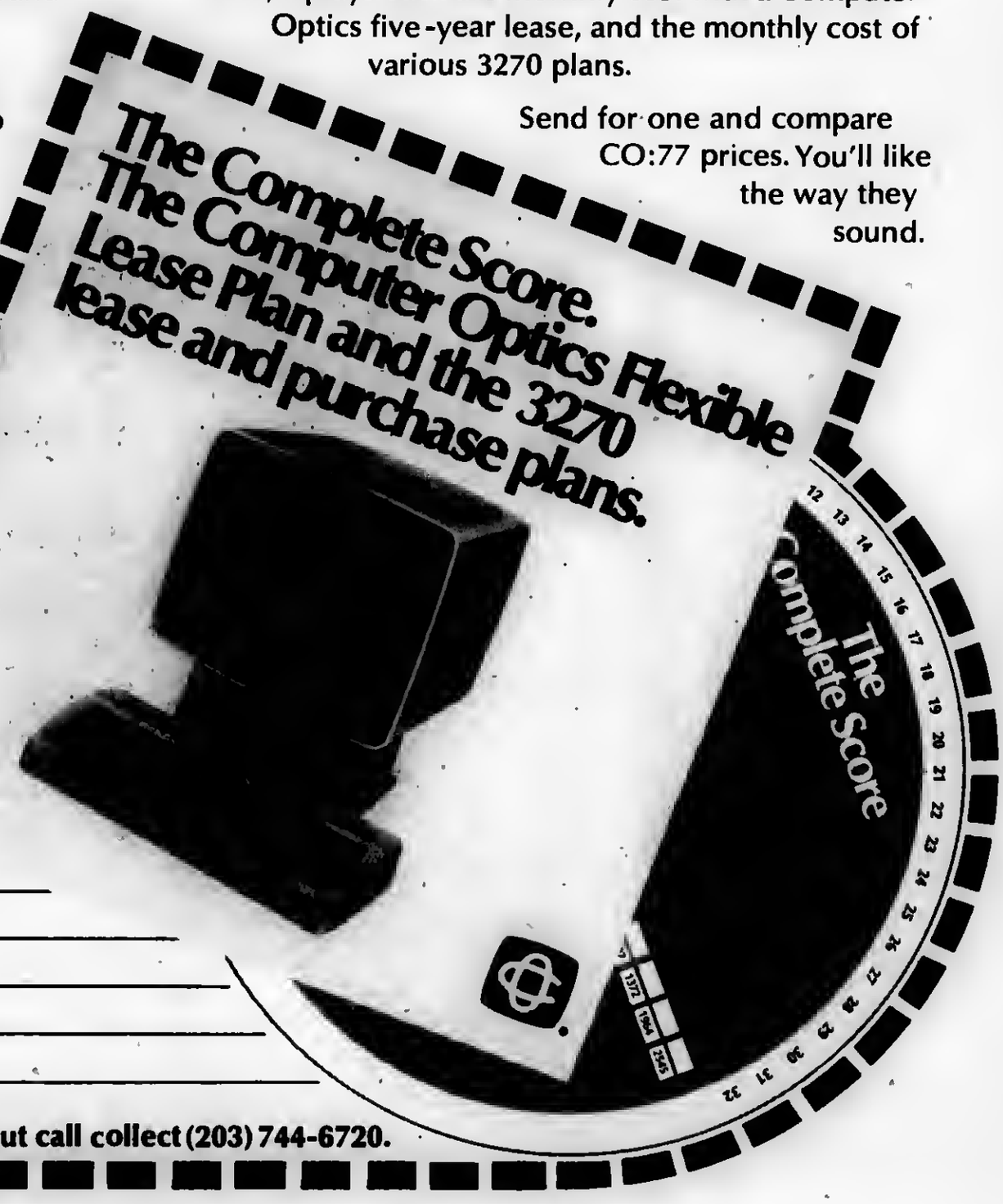
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DPMA Education Foundation to Provide Programs

PARK RIDGE, Ill. – The Date Processing Management Association (DPMA) has officially esteblished en education foundation and appointed e five-member board of regents.

The major purpose of the foundation will be to provide education programs and services for DP professionals, educators, the computer industry, business, government and the generel public.

One of its first projects will be to conduct e survey to identify the educational needs of the DP community, eccording to the DPMA group.

The foundation's first president is Roland D. Spaniol, director of computer services and professor of menegement at Eastern Illinois University. He also served as chairman of the organizing committee that established the foundation.

Other members of the board of regents are Howard B. Wilson, general director of menagement informetion services, Reynolds Metal Co.; George Glaser, consultant and former president of the American Federation of Information Processing Societies; Eugene B. Smith, essoclate professor of the business end research department of Texas A&M University; Edwerd Palmer, DPMA president; and T.Devid McFarland, DPMA ecting executive director, as an ex-officio member.

The board of regents will supervise, control end direct the affairs of the foundetion.

Societies/ User Groups

DP-Generated Art Set As ACM '75 Display

NEW YORK – The Association for Computing Machinery's (ACM) annual conference in Minneapolis/St. Paul on Oct. 20-22 will feeture a computer-generated art display.

ACM '75 registrants will also be given an opportunity to generate their own "real-time" art on interactive terminals while computer-composed music plays in the background.

The art exhibit, including both audio and visual works, will display objects such as wall hangings, 35mm slides and movies.

Works of art for display in any of the above media are being solicited and those interested should contact G.A. Champine, chairman, Computer Arts, 11006 Redisson Drive, Burnsville, Minn. 55337.

BCS, ACM Pact Gives Members Reciprocity

LONDON – The British Computer Society (BCS) and the Association for Computing Machinery (ACM) have signed an agreement for reciprocal membership.

The pact allows BCS members to join ACM at a discount of 20% from the usual subscription rate, and vice versa.

Members of the societies will be bound by the rules of the ACM or BCS and receive all benefits and rights of their grade, including publications.

"International cooperation and interchange of ideas between computing practitioners is especially important since the computing industry is international both in outlook and practice," Ewart Willey, BCS president, said.

NMA Forms 31st Chapter

WASHINGTON, D.C. – The National Micrographics Association (NMA) has formed its 31st chapter in Buffalo, N.Y.

After approval of its charter by the NMA board of directors, it will be known as the Western New York Chapter of NMA.

Calendar

Oct. 22-24, San Diego – 43rd Management Conference, sponsored by the Association of Data Processing Service Organizations (Adapso). Contact: Adapso, 210 Summit Ave., Montvale, N.J. 07645.

Oct. 23-24, Gaithersburg, Md. – Second National Symposium on the Management of Data Elements. Contact: Institute for Computer Sciences and Technology, NBS, Washington, D.C. 20234.

Oct. 28-30, Toronto – The Canadian Computer Show and Conference. Contact: Derek A. Tidd, Industrial and Trade Shows of Canada, 481 University Ave., Toronto M5W 1A7.

Oct. 29-31, New Orleans – Mid-Year Meeting of the National Micrographics Association. Contact: Conference Dept., National Micrographics Association, 8728 Colesville Road, Silver Spring, Md., 20910.

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S/2

'All You Ever Wanted to Know...'

Afips Booklet Has Details on Constituent Societies

MONTVALE, N.J. – A newly revised brochure entitled "All You Ever Wanted to Know About Afips Constituent Societies . . .But Could Never Find in One Place" has been published by the American Federation of Information Processing Societies (Afips).

The 24-page booklet defines the goals and purposes of each of the 15 professional societies in Afips in addition to listing membership requirements, activities, society publications, dues structures and the individual to contact for further information.

Societies/ User Groups

The publication also briefly describes the objectives and major activities of Afips.

Constituent societies discussed include the American Institute of Aeronautics and Astronautics, American Institute of Certified Public Accountants, American Society for Information Science, American Statistical Association, Association for Computational Linguistics, Association for Computing Machinery, Association for Educational Data Systems, Data Processing Management Association, IEEE Computer Society, Institute of Internal Auditors, Instrument Society of America, Society for Computer Simulation, Society for Industrial and Applied Mathematics, Society for Information Display and Special Libraries Association.

The brochure is available free from Afips' Public Information Office, 210 Summit Ave., 07645.

Smith Named NCC Board Head

MONTVALE, N.J. – Merlin G. Smith, a research staff member in the Computer Science Department of the T.J. Watson Research Center of IBM, has been named chairman of the National Computer Conference (NCC) board.

Member Since '73

He has served on the board since 1973 and is a member of the executive committee of IEEE Computer Society.

The NCC board is responsible for the operation of the annual NCC sponsored by the American Federation of Information Processing Societies.

Smith has been with IBM since 1952, where he participated in the early development of electronic computers. His current research activities are concentrated in the area of terminal-oriented systems and communications.

Call for Papers

1975 COLLEGE AND UNIVERSITY SYSTEMS EXCHANGE NATIONAL CONFERENCE, Dec. 3-5, Denvar.

Papers are sought on a wide range ot subject matter related to the conference theme, "Higher Educetion Information Systems: The Challenge of Change." They should be applicable to one ot the three major conference tracks: management topics, technical topics and management-tachnical topics. There will also be a special session for contributed papers not included in these tracks.

Abstracts should be sent as soon as possible to College and University Systems Exchenge, 737 29th St., Boulder, Colo. 80303.

THE FIFTH ANNUAL ASSOCIATION OF COMPUTER PROGRAMMERS AND ANALYSTS (Acpa) NATIONAL CONFERENCE, Oct. 1-3, Itesca, Ill.

In line with its theme of "Awareness: Pest, Present and Future," papers are requested on the topics ot privacy (data base and/or personal); OP certitication, ethical practices in information processing and tha implications of licensing of computer professionals.

Manuscripts should be typed, double-spaced and limited to approximately aight to 10 pages of subject matter. Completed papers must be submitted as soon as possible to the Acpa-V Conference Committee, P.O. Box 2349, Chicago, Ill. 60690.

MICROGRAPHICS '76, Feb. 12-13, New Orleans.

Micrographics will ba the subject of a winter symposium hosted by the Society of Photographic Scientists and Engineers. Papers are invited reporting original, unpublished work in this tield; raview papers ot unusuel interest will also be considered.

Authors must submit e one- to five-page double-speced abstract tor review by the Papers Committee no later than Sept. 30. All abstracts should be sent to Or. H. H. McGregor, Jr., Kalvar Corp., P.O. Box 13013, New Orleans, La. 70185.

NATIONAL MICROGRAPHICS ASSOCIATION (NMA) 25TH ANNUAL CONFERENCE AND EXPOSITION, Aprli 27-30, Chicago.

Papers are requested that follow the conference theme, "Spirit of Micrographics" and should fit into the tollowing categories: "Spirit of Micrographics Technology '76," "Spirit of Micrographics Implementation '76" and "Spirited Applications tor Special Interests '76."

Abstracts should be typed, double-spaced and et least 250 words in length. Complete papers must be submitted by Nov. 15.

For turther information contact The Spirit of Micrographics '76, Program Review Committee, NMA, 8782 Colesville Road, Silver Spring, Md. 20910.

1976 INTERNATIONAL SYMPOSIUM ON INFORMATION THEORY, June 21-24, Ronneby, Sweden.

The conference, sponsored by the Institute ot Electrical and Electronic Engineers, will cover coding theory, communications systems, computational complexity, computer communications, detection and estimation, pattern recognition, stochastic processes and shannon theory. Papers are invited in these and related tields.

There will be two types ot contributed papers — long pepers of 30-minute duration and short papers ot 15-minute duration. The long papers will be eccepted on the besis of a 500-word summary. Both should be submitted, with an abstract, by Nov. 15 to Jack Salz, Bell Laboratories, Room 1G-509, Holmdel, N.J. 07733.

14TH ANNUAL ASSOCIATION FOR EDUCATIONAL OATA SYSTEMS (AEDS) CONVENTION, Mey 3-7, Phoenix.

Papers are being soilcited in all areas related to computer use in instruction, educational administration or raseerch.

An abstract ot not more than 100 words is required by Dec. 1. Finel copies should be received by Merch 1 and should be typewritten and double-speced on special Aeds manuscript paper.

Mell papers to Max Ivey, 1976 Aeds Convention Program Chairman, Campus Systems and Programming, Wilson Hall-Room 206, Arizona State University, Tempa, Ariz. 85281.

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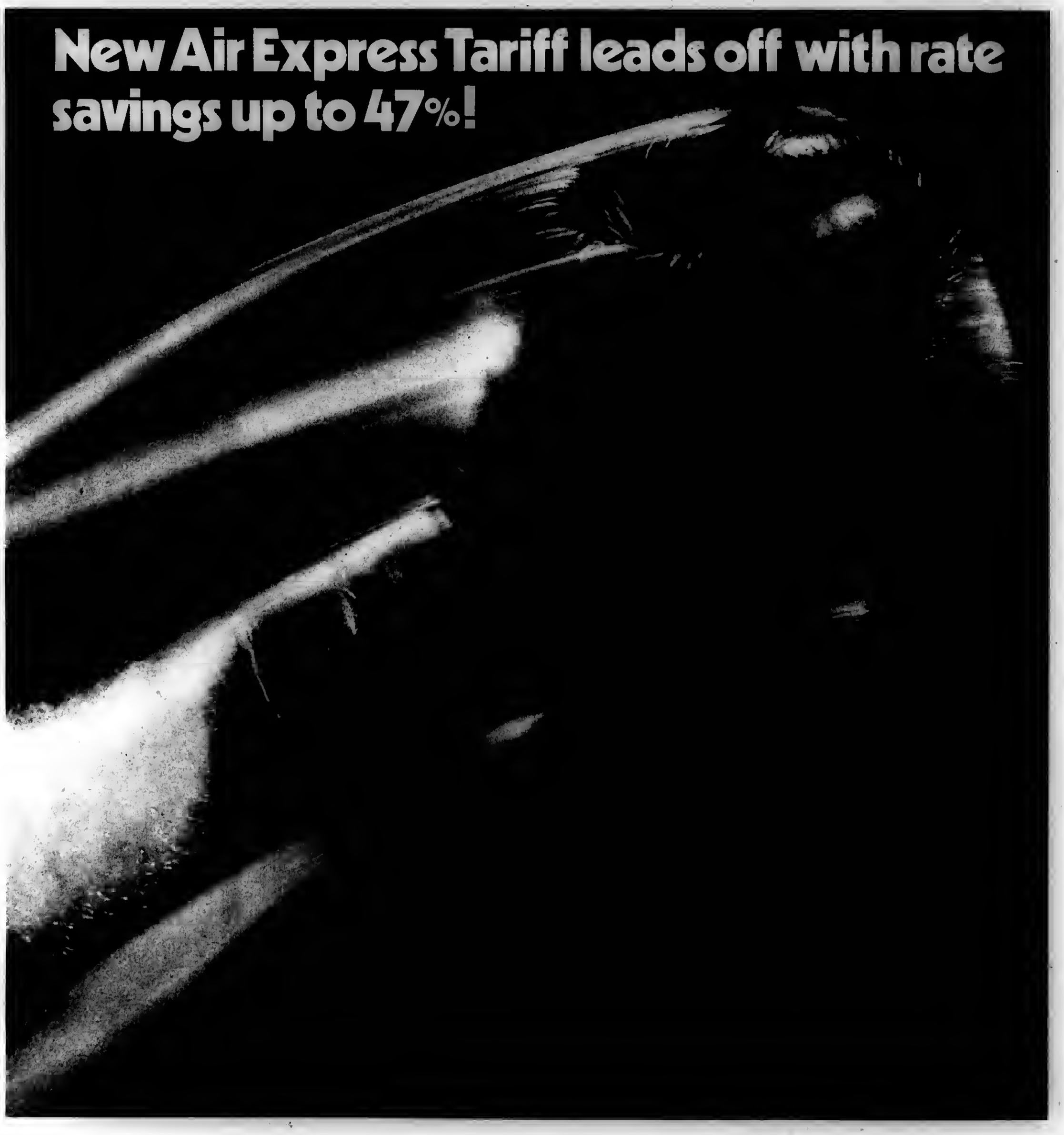
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Editorials

Not So Fast, Everyman

At first glance, the IBM 5100 portable computer is a step toward giving every small user his own processing power on the top of a desk [CW, Sept. 17].

But the device is too specialized to be known as Everyman's miniframe. This is actually a custom-tailored, problem-solving system best suited for complex environments.

The software initially announced with the 5100 covers such areas as economic analysis, statistics and mathematics functions. Certainly these capabilities are way beyond the needs of a small Cobol business user.

The features of the 5100 are comparable to those available for some time from firms such as Wang and Hewlett-Packard and known as programmable calculators. And, as might be expected, IBM has issued a Cadillac-priced model that is much more expensive than other similar devices.

IBM has clearly avoided any impact of the 5100 on the small business user. For the time being, he has to be content with the System/32 if he is looking to IBM for an entry-level machine.

Only Time Will Tell

The Info 75 show in New York this month may have proved the industry is not yet ready to return to the golden days of the '60s when the Spring and Fall Joint Computer Conferences drew huge crowds to Atlantic City and Las Vegas.

The comparison with an American Federation of Information Processing Societies (Afips) show was inevitable and the much smaller size made Info look more like a regional show than one which is national in scope.

Perhaps these ideas are too negative for a show that is only two years old, however. Maybe a maturity cycle is required before a computer conference reaches national attention and stature.

But in the hard-facts department, the Info 75 attendance was off from '74 by about 600, with final attendance at about 11,300. Booths rented by exhibitors were also down from last year.

On the plus side, the show was geared to provide technical sessions which concentrated on the user's point of view and stressed operational experiences. This type of technical program should be more attractive to users than the more esoteric gathering in which researchers talk to academic types about problems far removed from the real world.

There were some minor complaints from exhibitors about lack of job title on conference badges, and some attendees at the technical sessions were hard-pressed to keep up with last-minute room changes.

Next year, Info plans to go to Chicago in November. Maybe the week after Labor Day, just when the busy fall season is gearing up, is a bad time to wrench a user away from his office.

Whether we really need a second industry show each year is up to both attendees and exhibitors. Time will tell.



'What Do You Mean, This Is the GOOD News?'

Letters to the Editor

Interactive Programming Savings No News to Decsystem-10 Users

As a user of a Decsystem-10, I was appropriately underwhelmed by Don Leavitt's article on the IBM 370/135 installation at Carolina Steel Corp. [CW, Sept. 10].

Once again, we witnessed the discovery of the benefits of interactive programming by a 370 shop. The element of news in this article was apparently that programmer productivity has doubled and response to user requests is tremendously improved.

This is not news! Decsystem-10 users have been enjoying these advantages for years. A truly newsworthy item would be that a Decsystem-10 had replaced the 370/135 at Carolina Steel, resulting in significant improvements in performance, throughput, programmer productivity and service to users, at a 30% reduction in cost.

Jim Post

McAllen, Texas

POS Systems Must Consider Users

If grocery stores persist in plans to not mark the items, they had better be ready for a lot of hassle and slowdown in check-out lines while the customer checks to see that he has been charged the proper amounts. The really significant points for grocery people to consider are:

- Shelf pricing isn't accurate today (for various reasons) and it will be even less accurate in the future.
- Itemized price lists won't work. Consumers can't effectively utilize them because they are not convenient and can't describe the product completely enough.
- Consumers in general are extremely wary of being "ripped off" by business due to the inflation of the last two years. They will see this as an excellent opportunity to be ripped off and will resist it strongly.

Les Pitstick

Dayton, Ohio

Stub Relationships the Issue

I am writing concerning the continuing hue and cry over structured programming in general and Edward G. Niles article, "Poor Program Modules Add Extra Layer of Obscurity" [CW, July 30] in particular.

First the use of "stubs" (anticipated black boxes) in top-down design is the computer analogy to span of control in business organizations. There are limits to the number of elements which can be directly controlled.

The issue is not the intrinsic simplicity of a particular element; it is the relationship of the element (stub) to other elements externally and internally.

Second, the suggestion by Niles that a module not call any other modules was patently absurd. Restated, it implied the driver module is not subject to the same philosophic constraints of other modules.

Obscuring the mainline's primary function of matching master records to transactions by including undifferentiated levels of subsequent decision making cannot help the recurring "first time, control break, last time" bugs which plague new development.

For any nontrivial application, following Niles' recommendation would result in 90% mainline (with innumerable GOTOs and compound nested IFs) followed by 10 to 20 modules handling from .2% to 1% of the code.

Jon C. Miller

Chicago, Ill.

Who's Herb Grosch, Anyway?

At age 10, I moved to a farm in rural Oregon. The new friends I cultivated during the summer constantly referred to the hero of the local grade school, Stinky Mildoon.

It was always, "Stinky said this" or "We'll have to check with Stinky on that subject." In the two months prior to school, I had built up an image of this clusive boy that would match any leader of the Free World.

I made one mistake, however, and that was to bring up the philosophy of Stinky Mildoon in an attempt to avoid punishment. My father, ignoring this new logic and philosophy, proceeded with the spanking I richly deserved, then asked me about this new hero of mine.

I expounded on my hero's words and philosophy, but soon realized I really knew nothing about this person which I could use to defend his supposedly superior thoughts and reason.

I learned that day to always inquire and review carefully the reference and credits of people who hold themselves up as experts or spokesman for any group or profession with which I'm associated.

Now my question is: "Who is Herb Grosh?"

Each week we, the loyal readers of *Computerworld*, are subject to the words of a man no one seems to know.

The column he wrote in the Sept. 10 issue left me in awe because it takes real talent to confuse one's readers to the point where they do not know whether one is writing about sex, mineral water, atomic war or computers.

I wonder – could Grosch be a grown-up Stinky Mildoon?

Jerry L. Poppenheimer

Phoenix, Ariz.

(Other letters on Page 16.)

To Run a Railroad

One of the technical tours which concluded the U.S.A.-Japan Computer Conference took attendees far into the Tokyo suburbs to the computer center of Japan National Railways (JNR). This is the company which leads the world in practical use of high-speed trains; we call them "bullet trains," the Japanese say "Shinkansen."

There were typically Japanese touches to the visit. First of all, we went by bus – the huge building is not on a railroad line! Second, the bus driver and tour guides got lost: it's easy, in Tokyo! So they asked a police patrol car, which then drove ahead of us through an assortment of *medina* alleys, narrow streets and divided highways (in seemingly random sequence) to our elusive destination.

We were met with slippers and shoehorns, hot towels – a magnificent custom – and iced tea. And a lecture, complete with interpreter. And a wonderful tour. We were all outfitted in nylon shop coats and peaked caps before being taken into the computer area; I was strongly impelled to take one of the latter as a souvenir, but refrained because I feared the ideographs on the hat probably said "Tokyo Linen Supply" rather than "Shinkansen."

JNR was mostly Nippon Electric communications gear. Besides literally hundreds of land lines into Kunitachi, the computer center "town," it operates two dedicated broadband microwave links to the main office in downtown Tokyo, one via the Eiffel-like Tokyo Tower, the other via the 50-story Keio Plaza hotel. One link carries all traffic, and the other is standby.

Power is similarly protected; JNR runs off two 66 KV feeders into two heavy motor-generator units, which are backed by two half-hour battery sets, which in turn are backed by a standby diesel system. The air conditioning is also protected, with five extractive units and three cooling towers. It intends to *operate*!

The computer rooms are heavily Hitachi, and Hitachi also cooperated in the very large software tasks involved in the "sales management" – that is, reservations – system. The communications control central has three processors and the file control central has three more; of each triad, one is up, one is ready and one is in maintenance or doing batch. The two centrals add up to 195 boxes: a very big shop indeed.

Passenger service constitutes 85% of JNR business, and computerization goes back to 1960, with a big jump to completely cover the reservation of the new bullet train capacity in 1964, five major extensions during the next decade, and the introduction of push-button telephone reservations early this year, in the Tokyo area only.

We had a demonstration of the audio response system. The customer keys in the special JNR number and gets a mechanical response which tells him to key in the number of the phone he is using (a recovery procedure). He is then told to key in a timetable label (one digit), the date wanted (four digits), the train number from the timetable (five), departure station code (four), destination (four), number of seats (one), class (one) and an end digit. Between each entry, the audio response reads back what the computer received and coaches the customer on what comes next.

The computer then recites the reservation number (four digits) and makes the customer key it back in to prove he got it right. It then does the *arigato* bit and tells him to pick up the tickets at any Tokyo ticket counter by a specified date. When the customer appears and furnishes the reservation number, an automatic printer instantly produces the ticket. I have one – but it's for Sept. 31. No free samples!

What a way to run a railroad!

Oh, about size: the telephone system, a special group reservation system for tours (up to 980 people!) and the regular ticket office terminals handle 645,000 train seats per day. The system has a current capacity of a million seats per day and can handle, during the summer travel peak, 1.5 million inquiries per day. When reservations windows open at 9 a.m., inquiries sometime reach 130,000 per hour.

Doesn't remind one of the Penn Central, I tell you!



Herb Grosch

But Customers Suffer

Ignoring DP 'Hot Spots' Protects Airlines' Interests

The Taylor Report
By
Alan Taylor, CDP



The system "hot spot" in the United Airlines reservation system reported in this column [CW, July 16] has survived two presidential-level inquiries by United officials. Management now knows that there was no proper reason why Jerry Matlin's reservation to fly from Norfolk to Minneapolis was canceled and that this cancellation was not an accident, but part of routine systems action.

Yet, despite this, the practice has neither been stopped nor condemned. Both United Airlines President Richard Ferris, and Computer and Communications President Glen Belden seem to think everything has been satisfactorily explained. Which suggests there must be yet another, deeper hot spot existing in the United reservation systems design than just reservation cancellation methods.

The basic facts are no longer in dispute. Piedmont Airlines, without any authorization from Matlin, issued the cancellation instruction to United when Matlin did not show up for a flight from Raleigh to Norfolk. President Belden agreed totally with Matlin that such a "no show" is no reason to cancel later flights and certainly not flights that are eights days later, as this one was. Belden argued that even no shows which would apparently make it impossible for a passenger to catch an onward flight cannot properly be used to cancel reservations, in view of the possibilities presented by concurrent flights on other carriers or the fact the passenger may have gone on ahead earlier.

The Piedmont message, which should have been a simple report of a no show, did not claim to have originated from any Matlin authorization, although United at first claimed it had. It was in standard interairlines form, which omits this vital characteristic. United reservations personnel are aware of the practice of airlines such as Piedmont to automatically issue such unauthorized cancellations for no-show reasons. They are also aware that reported no shows can occur even though a passenger has in fact canceled his reservation and is not a no show at all. Despite this knowledge, United continues to accept these unauthorized "cancellation" messages at face value. This was and continues to be the system hot spot United has not addressed.

Appeasing Piedmont?

Or at least, United has not addressed this problem directly. The Ferris investigation of the Matlin situation does, however, contain a possible clue to the matter. Frank Dunham, writing at the request of Ferris to Matlin included, apparently gratuitously, the comment: "Our interairline carrier friends (Piedmont, Delta, North Central, etc.) account for more seat bookings cancellations and changes than any other single business source outside our own company."

The meaning of the sentence is not clear. The cited interairline carriers are not a "single business source." But the thrust appears to be United is carrying out its reservations for the purpose of satisfying its business sources – rather than satisfying its contractual commitment to individual passengers. This commitment called for United to use its "best efforts" to carry Matlin from Norfolk to Minneapolis.

United, which has so far ignored this crucial question, has not claimed it is using its "best efforts."

Cause of Inquiry Failure

As a result, the question of what the system should do has been changed into an appeal for understanding that what it does do is in the interests of United Airlines – as that entity sees them. This change permits cases where accurate data processing is not seen as serving United to be swept under the rug, even though the system has ample information to handle the cases properly.

Piedmont and other airlines using similar procedures are certainly imposing an inconvenience penalty on no-show passengers. This they may feel is useful in its (Piedmont's) flight planning.

And United may be cooperating by enforcing the Piedmont-imposed discipline, so it will continue to get these valuable seat bookings from Piedmont. But this does not explain why United has flubbed both investigations. That seems to be a second, real hot spot all by itself.

Is Information Auditable?

As far as I can see, the second hot spot lies in the fact information – unlike accounting and engineering – cannot really be audited. An information error, except when it is simply reporting an accounting error or an engineering error, can be investigated to death without ever having to face up to the real problem. The Ferris investigation was handled by:

- Finger pointing at Piedmont.
- Agreeing with Matlin's observations and theories.
- Claiming interairline carriers were valuable business sources.
- Saying the information that passes between airlines is very reliable.
- Claiming the case was "a rare exception to the norm."
- Ignoring the Piedmont response.
- Ignoring the Matlin response.

The Belden investigation was equally irrelevant. It consisted of:

- Claiming Matlin personally initiated the cancellation.
- Admitting Piedmont policy initiated the cancellation.
- Admitting Matlin had no access to either United or Piedmont policy.
- Putting on a demonstration of the reservation system for no apparent, relevant reason.
- Asking for a Taylor Report clearing United Airlines.

All of which effectively ends up in a management dead end. There are still no out-of-balance items which would have occurred in an accounting system. Matlin can now be written off as a crank to be answered by lower and lower officials and eventually ignored.

This, then, is the new hot spot that can be seen in the United reservation system. Errors in the system, even when investigated by the highest authority, do not have to be faced up to, but can be ignored. There is no equivalent in this system of a boiler bursting – which was what put engineering design on the right path last century. Data processing is, and will apparently remain, an art, rather than a science. And yet it is being treated like the science that it is not.

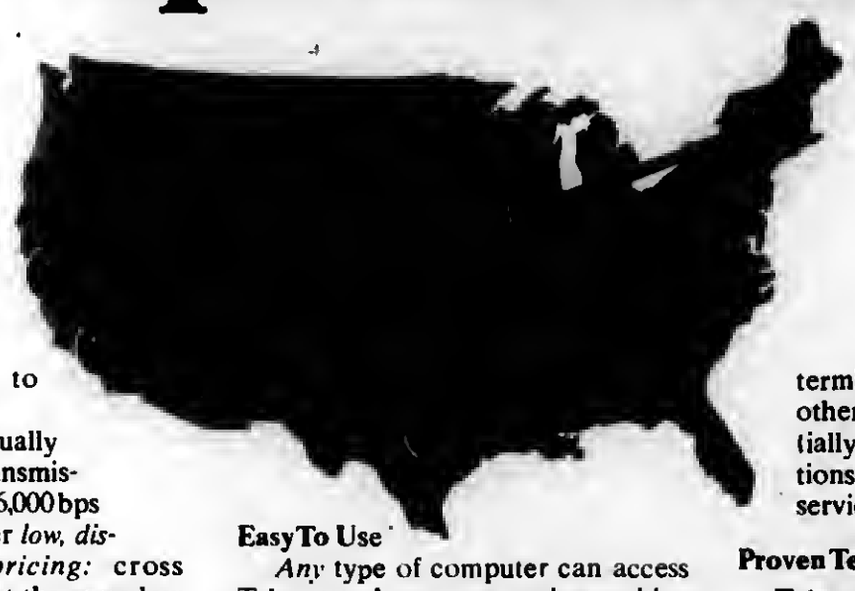
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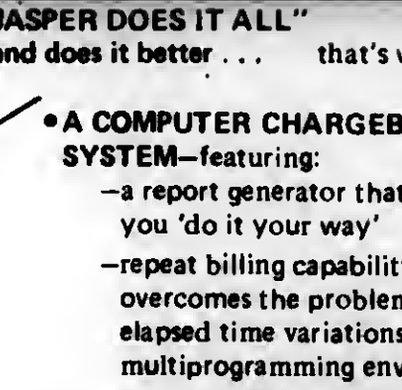


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Letters to the Editor

DP Layout Artist Needed To Check Changes on W-2s

Once again programmers around the U.S. are busily revamping computer programs to accommodate changes made to the W-2 forms.

By now one would think that the Internal Revenue Service would have received so much flack from previous revisions that this year's changes would be minimal. They are not.

I believe it is time for an industry spokesman like Herb Grosch to plead our case. Think of the many dollars spent each year by industry to make the changes, many of which appear to be unnecessary since they merely represent layout form changes.

Even then, the new format does not appear to have been designed or checked by a DP layout artist.

H. Richard Winkler
Cincinnati, Ohio

Sample Not Significant In Survey of Software

The July 2 issue of *Computerworld* carried a banner article entitled "Packages' Contents Rank Higher than Documentation." The article reported on a survey conducted in Paris by the French publication *Zero-Un Informatique.*

Zero-Un compared software packages which are vastly different in purpose, capability and extent. Comparing Librarian to Panvalet may be valid, but comparing Fast Dump/Restore to Mark IV is ludicrous.

The article pointed out that "the results should also be considered in light of the fact that the questions favored small products with sharply defined functions to the detriment of more ambitious packages." If the IBM IEFBR14 program were sold as a package by itself, it would have undoubtedly rated a clean 4.0 in all categories.

France has, at the current time, only 43 of the 900-plus world-wide installations of Mark IV. The U.S. and Canada, on the other hand, have over 626 installations. Polling the small French Mark IV-using population can hardly be considered statistically significant.

Edward E. Straub
President
Mark IV User Group
Canoga Park, Calif.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

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Data Base Systems Found Across Wide Range of CPUs

• IDMS, on 370

DEDHAM, Mass. – For the last few years, full-service banks have been pursuing data processing techniques which allow all of the accounts of a customer to be viewed and processed at one time.

Data base management systems provide the logical data relationships needed to accomplish this task and also provide the direct access to data needed for on-line systems.

The Norfolk County Trust Co. (NCTC), based here, is about to put such a system into production, according to Vice-President A. Neill Osgood Jr. Tabbed the All-Purpose Bank Plan (APBP), the system consolidates information about checking accounts, savings accounts, 90-day notice savings, reserve credit and Master Charge. Other types of accounts will be added to the data base later.

NCTC has carried the design one step further than usual in that all of the customer's accounts have the same account number. From any single account, each related account for the customer is easily determined and located.

The system is written in Cobol using structured programming techniques to ease program maintenance and allow new additions for bank processing needs and greater customer service capability.

At the core of the system is IDMS from Cullinane Corp., selected after a lengthy study of available data base packages by NCTC, with considerable assistance from a consulting organization.

High on the list of selection criteria were data independence, Codasyl compatibility, full network data structures and the ability of the data base to grow in size and scope without reloading or reprogramming.

Since the bank has a relatively small staff, the minimal system programming requirements of IDMS and Cullinane's reputation for customer support were the clinchers, the firm said.

Machine Resource Requirements

A major concern in the design of the system was the machine resource requirements. Compared with the old system, which was written in BAL with independent sequential disk files, the design, which included the generality and flexibility of IDMS along with Cobol and structured programming, was expected to be minimally slower in execution and higher in main memory and I/O requirements on the bank's 370/145.

The only fear that materialized somewhat was the main memory requirement, which increased from about 50K bytes to approximately 120K bytes for the largest programs. Inspection of old and new programs has resulted in the feeling that the additional overhead for Cobol and IDMS was more than offset by ease of program maintenance, program isolation from data base change and the other expected advantages of data base management.

System testing has shown the system is no more costly to run on a daily cycle or statement basis than the old.

The daily cycle begins with the APBP transactions being received and stored throughout the day as part of the 200,000 to 250,000 transactions which NCTC processes each 24 hours. From this composite file, the approximately 60,000 transactions belonging to the current APBP data base system are selected out, sorted, edited and written to a sequential disk file for use by the subsequent posting run. This step takes about 25 minutes.

Application programs then process these transactions against the approximately 70,000 APBP accounts in the data base, performing all maintenance and dollar activity concurrently for all customer account relationships. The run includes the printing of a complete, detailed trial balance for each branch and takes 90 minutes with no printer spooling.

Major features of this posting run are daily updates of the name and address information, which used to be weekly; the generation of daily current and consolidated information for anticipated on-line use; and the substantially lower I/O activity due to the direct access and physical sequential record organizations within IDMS.

The next major step in the daily processing is a report run to produce more than 30 reports such as exceptions, overdrafts and the like for bank management, auditing and operating use.

(Continued on Page 18)

• DRS, From Mini to Mainframe

By Linda Gardner
Special to Computerworld

NEW YORK – Answering questions about the social services provided to 8 million New Yorkers is made easier for the Office of Information & Referral Manuals (Irma) by using the Data Retrieval System (DRS) from Aeronautical Research Associates of Princeton, N.J. (Arap).

Irma manages New York's computerized inventory of government and voluntary agencies offering services to the public. Irma serves the referral and planning needs of the helping agencies of New York by providing computer-generated reports and directories containing current services information.

Irma's citywide data base of approximately 1-1/2 million characters has 6,000 records, each containing over 50 numeric and text fields of facility information describing 15,000 services. Major linkages are provided by service and eligibility descriptors, an administering agency structure and geographic locators. Three supporting data bases, totaling 14,000 records, facilitate the processing of secondary sources (printed directories, other computerized files, etc.) as well as the development and maintenance of Irma's controlled services vocabulary. Currently Irma data bases are undergoing redesign to take full advantage of DRS's hierarchical capabilities supporting multiple record types and networking linkages among record types for one base.

Ease of Use

Four years ago, DRS was selected primarily for its ease of use; text editing features; complex string manipulation capabilities during data selection, arrangement and formatting; and its low cost.

Irma also required a system that was easily machine transferable – DRS provided it. Developed on Arap's own Digital Scientific Meta-4 minicomputer emulating an IBM 1130, DRS is available on both small and large computers and time-sharing systems. Irma's first microfiche directory was produced using the 1130 version in June 1973. For the past two years Irma has used DRS on an IBM 370/145 using both VM/CMS and OS/VS1 for directory production, maintenance and program development.

Starting this fall, Irma production jobs will use DRS at another New York City installation on an IBM 370/158 using OS/VS2. In every case, changes in hardware and operating systems have been transparent to Irma staff, requiring no alteration of Irma DRS procedures.

Generalized System

DRS is a generalized information retrieval system providing data base management. There are over 60 commands available to allow data maintenance, selection, field redefinition, arranging, statistical processing, listing and report formatting. Two areas of specific Irma applications, data entry and directory production illustrate the scope and flexibility Irma has enjoyed with DRS.

Irma receives information from many sources such as mail verifications (with DRS-produced mail labels), telephone, other directories, newspapers and other clippings, government liaisons and cooperative collection efforts with other agency staff. Effective management of this collection network demands control and text editing capabilities with minimal additional encoding requirements.

Irma maintains control data describing source and data for fields affected by given transactions using the DRS LINK feature which enables the more program-

(Continued on Page 22)

• Image, on HP

Special to Computerworld

DENVER – A minicomputer, combined with a data base management system, has enabled the city and county of Denver's Manpower Administration to retrieve information almost instantaneously, instead of days or sometimes weeks later, while reducing its programming load more than 50%.

Funded by the Department of Labor, the Law Enforcement Assistance Act (LEAA) and local funds under a federal revenue-sharing program, the municipal agency finds jobs, arranges on-the-job training and provides vocational education to raise job skills for disadvantaged and low-income men and women. The LEAA budget contribution stems from the acute need for job training for ex-offenders to preclude their return to prison.

The administration's data bases include information pertaining to more than 12,000 individuals contacting the agency annually plus cooperating empoyers, subcontractors and the agency's employees. A Hewlett-Packard 2100 with 32K core memory, using HP's disk-based Image/Query data base software, was set up last November to replace a card-oriented IBM 1130.

One Timers

"Many of our programs are one timers," according to Lou Stover, the administration's director of management information systems. "A manager may need to know quickly the number of females registered with the agency who are heads of households and with two dependents," she explained.

By accessing the data base in simple English statements, QUERY retrieves such information in a matter of minutes. Within 10 lines of QUERY procedure statements, output also may be formatted under specified columnar headings on the agency's 200 line/min matrix printer.

In the event a user expects the listing to be of future use, it can be labeled, stored on disk, retrieved for maintenance or invoked for production use by requesting the report name.

"With the management information system, we now have one major file for all planners. The programmer does not create overlapping files of duplicate data. And all data balances," Stover said.

Enhancing the agency's ability to perform exploratory inquiries is the system's sorting capability. On an unscheduled basis, the Department of Labor, for example, requests lists of individuals participating in one of the agency's training programs of working for a cooperating employer. The lists are used to cross

(Continued on Page 18)



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370-Based IDMS Drives Bank Service

(Continued from Page 17)

The final daily step is to merge the 60,000 transactions into the transaction history area of the data base. Approximately 1 million transaction history records are present in the data base at any one time.

The records are organized physically sequentially by account number in their own area and each tied to the appropriate master account record by an IDMS set relationship. As a result, the account number is not even carried in the transaction history records, which results in considerable disk space savings. This run requires less than one hour.

Statement runs are made four times a month. All the APBP accounts for a customer are summarized in the heading of a single statement, and the complete detail follows the summarization. Approximately 17,500 accounts are stated in each run. As the detail is printed, the postings are essentially recalculated and checked against the account master information for verification. As the statements are prepared, the detailed transaction history for each customer stated is deleted from the data base so a new log for the next statement period may begin. Interim statements can also be produced easily for the first time.

NCTC prints its statements two up. Any statement may consist of multiple pages, and these pages must be printed vertically so that Page two follows Page one when the stack is split and decollated. A program prepares one-half of the statements in print image form and writes them to tape by following a special IDMS set for a specific statement cycle.

A second program then reads the tape writing those statements to the left side of the two-up form and simultaneously reads the remaining half of the statement cycle set in writing statements to the right side.

The direct access, physical sequential placement and set relationships within IDMS offer a somewhat novel opportunity which is not currently being used at NCTC. IDMS allows a logical area to be split into sectors and placed on several files if desired.

A program could begin printing statements for accounts from the beginning of the transaction history area on the left side of the two-up form and simultaneously print statements for accounts starting in the middle of the area on the right side of the form.

To avoid excessive disk arm movement in alternating from an account for the left side and an account for the right side of the form, the data area could be split in half and each half placed on a file, with each file on a separate pack. A separate read head is then available for each of the two sectors of the area and each head would move serially across the sector, producing a highly efficient run.

HP's Image Aids Denver Agency

(Continued from Page 17)

check with similar lists revealing individuals receiving unemployment compensation from the state of Colorado. The lists may be printed in Social Security number order or by name of individual. Thus any illegal payments may be quickly discovered.

Prior to installing the HP system, information requests were specially programmed. As a result, the systems analyst spent most of his time helping the agency's programmer. "About 65% of my time was spent putting out programming fires," Stover said.

Now only one programmer is required, who can devote uninterrupted time to repeat programs; the systems analyst is seldom involved in programming; and Stover finally has time to manage the system and plan for future requirements that may be placed upon the agency.

Birth Problems Minor

Birth problems of the system were relatively minor, Stover said. However, she emphasized as mandatory an understanding top management. "Three of us literally took four months off to build the data base."

The first step was an extensive series ot meetings called by a Manpower administrator, Joe Lambrecht. After introspective discussion, various managers sharpened their focus on what information was essential in a common data base to realize their objectives.

Subsequently DP personnel built a data base that met the need of responsiveness to management's required information.

Data sets within the Client Data Base include demographics of disadvantaged individuals, transactions, follow-up information (after job placement), agency employees involved with individual cases and subcontractors (private, nonprofit training schools). Other data bases pertain to fiscal information, the agency's summer youth program and cooperating employers.

To Remain In-House

The HP system was selected vs. other alternatives such as time-sharing primarily because of the perceived need to remain an in-house operation; the availability of a data base system with a minicomputer and its costs.

The 32K system with its four 20-M byte disks, paper tape reader, magnetic tape drives, line printer, mark sense card reader, a video display console and the Image/Query software cost the agency a monthly rental equivalent of $1,400, slightly less than the total monthly rental of the far less capable, card-oriented computer and a required keypunch and sorter it replaced.

ACM Offers Meeting Papers On Structured Programming

NEW YORK – The proceedings of the Codasyl "Symposium on Structured Programming in Cobol – Future and Present" have been published by the Association for Computing Machinery (ACM). The symposium, sponsored by Codasyl's Programming Languages Committee last April included 14 papers in which the authors described working experiences with structured programming techniques using Cobol.

The 280-page proceedings were edited by Henry P. Stevenson of Bell Laboratories, Inc. and can be ordered from the ACM Order Department, P.O. Box 12105, Church St. Station, 10249.

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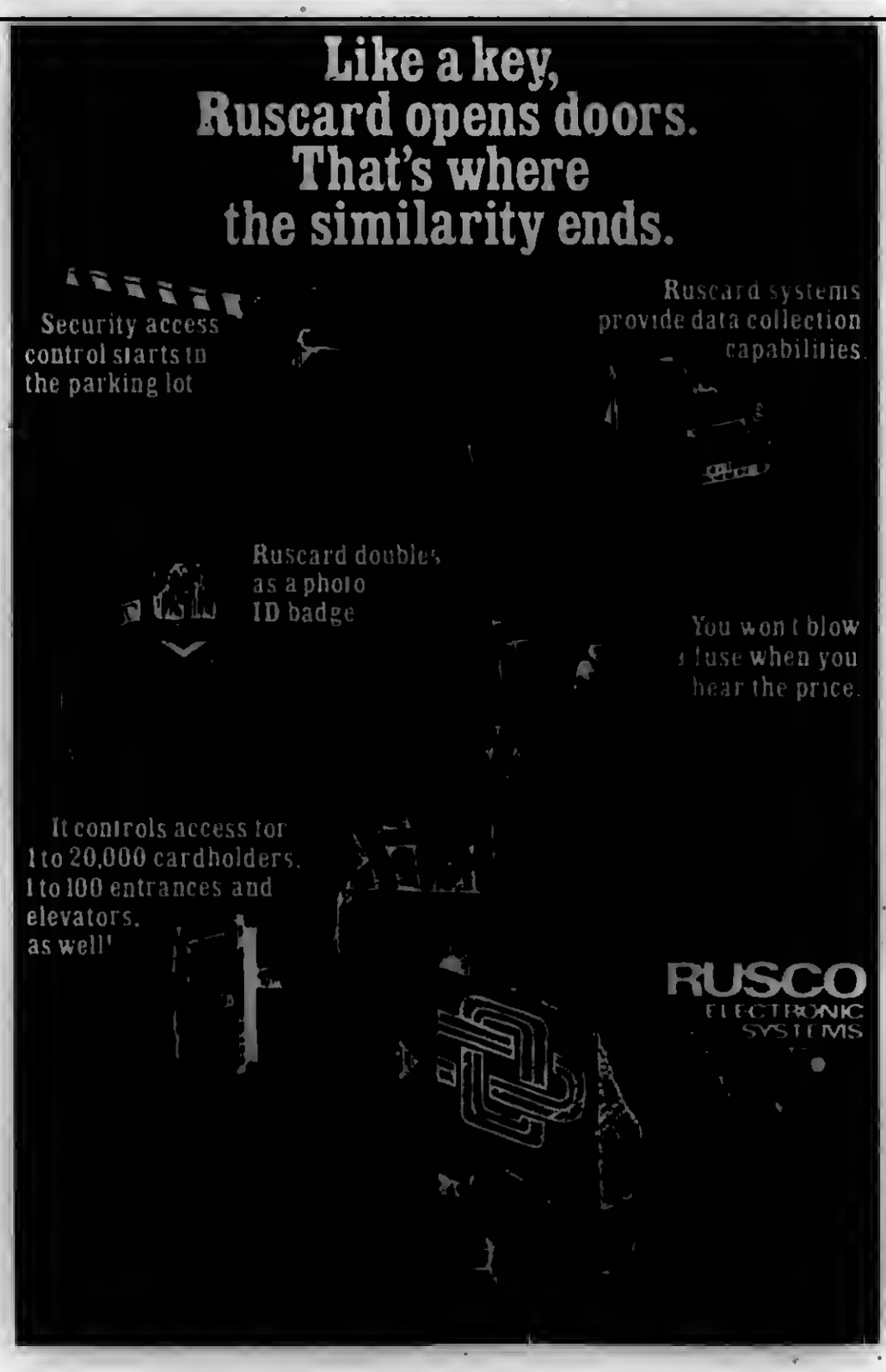
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Choice of First DBMS Project Vital But Tricky Chore

By William Casey
Special to Computerworld

After any data base management system (DBMS) package has been brought in-house, one of the more critical decisions to be made has to do with the nature and scope of the first data base projects.

Concepts and Techniques

In most instances, management knows generally which application area or areas are to be attacked, but within that overall plan there are many specifics that have to be worked out. This definitional process is frequently turned over to the data base administrative staff.

The staff's systems analysis work will determine the exact bounds of what is to be done and the stages in which it is to be accomplished. By approaching and executing the job which faces it with a proper degree of caution and an understanding of what is expected of it, accurate results can be achieved without slippage in time schedule.

Before this scope-defining process takes place, the data base administrator should be aware of two factors which are going to be present independent of all other considerations.

First, nuances and special design/performance variables are inherent in any DBMS. These are going to take time to recognize and take into account and can result in a certain degree of reanalysis or redesign.

This "foible factor" can be reduced and, in some instances, eliminated if design talent familiar with the package is already present on-site and/or vendor assistance is high.

Learning Curves

The second factor – programming and analysis learning curves – focuses not on the attributes of a particular DBMS but rather on the fact that any newly acquired skill becomes more dependable and easily applied the more an individual practices it.

If more than a few persons are going to be programming data base-oriented applications, the chances are reduction or elimination of this factor will be unlikely. There is, however, a marked variance in eventual ease of use between packages. Therefore, persistence of the learning curve problem six months, a year or two years hence is something that should well be taken into account.

For this reason, conversions are often convenient ways to experience the learning-curve process. Before new design and programming ground is broken, staff members attain a working knowledge of the DBMS while still accomplishing something useful.

Of course, to do a conversion, there has to be something to convert which is *worth* converting. Sometimes folks forget this.

Smaller Design Quirks

Given the above two factors with which the data base administrator must deal – package foibles and programming learning curves – it is easy to say that the optimum choice of scope focuses around smaller, noncritical aspects of the data base project. The problem with this seemingly attractive recommendation, however, is it is hard to find much in any project which is truly "noncritical." As a result, analysis and programming must in most cases be under way in earnest for some time before many of the smaller design quirks are known and programmers feel familiar with their new environment.

Based on my experience, it seems many successful data base management projects owe their results to the proper combination of two elements: long-term system scope and short-term accomplishment. While a certain percentage of DP installations appears to overdo the system analysis phase (they pass papers and other specifications around to one another in a seemingly unending loop), the more typical problems result from insufficient or inaccurate initial planning and design.

Combining adequate design procedures and safeguards and at the same time allowing for closely spaced but meaningful project milestones is a genuine challenge.

Stepping-Stone Approach

The distinction between these two ingredients must be established clearly. The stepping-stone or building block approach is important: parts of the overall project are specified in such a way that small portions of it become operational in defined stages. This technique permits assessment by management in preestablished discrete time frames and permits end users the wonderful thrill of legitimate system output beforc the entire project is on the air.

For the technical staff, the effect is equally salutary. They feel a deserved sense of accomplishment by seeing the "fruits" of their labor and experience a feeling of relief as the "all or none" atmosphere of a single deadline large project has been

(Continued on Page 22)

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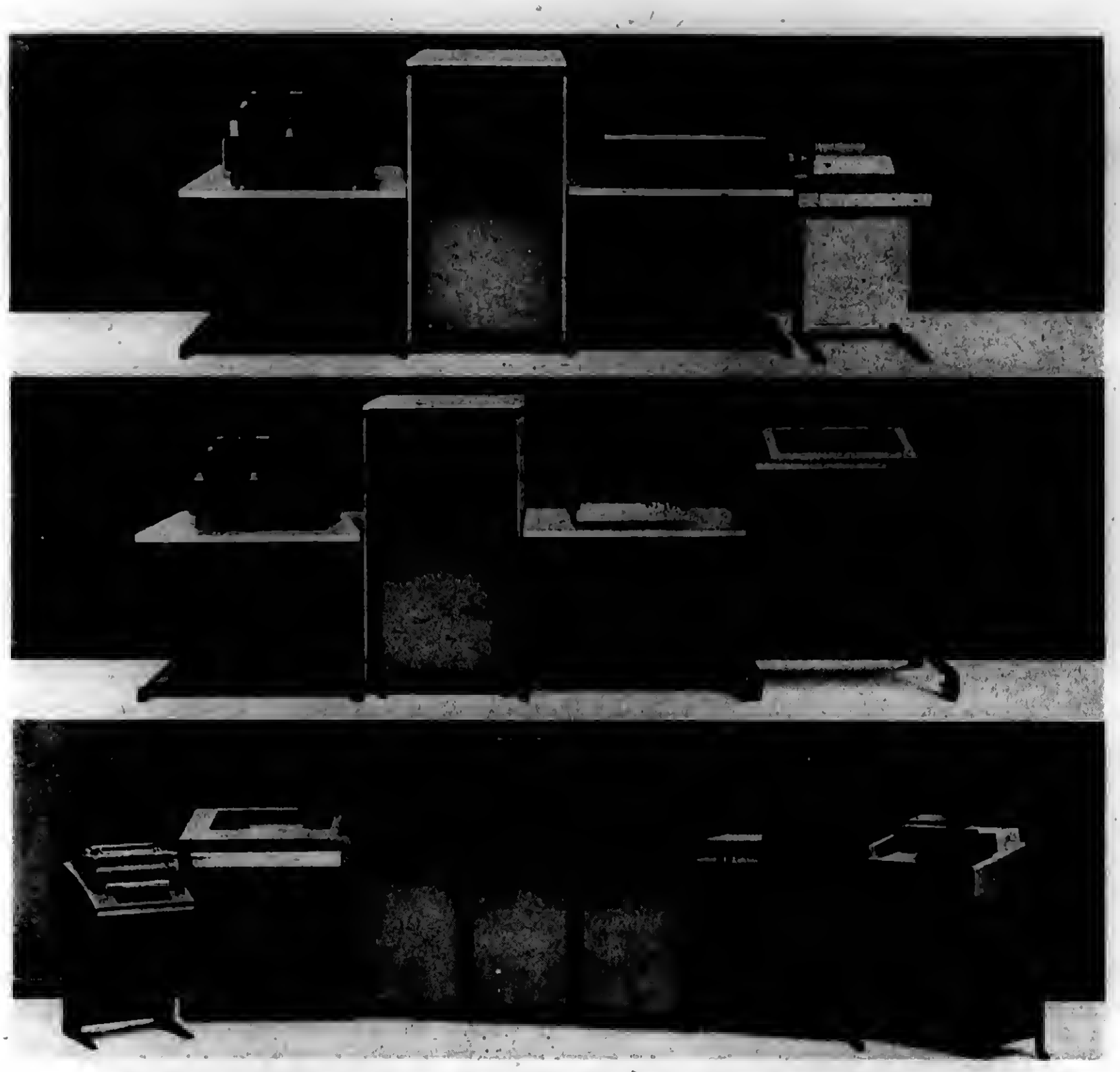
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No Need for In-House DBMS

American Honda Uses Remote-Computing Net for IMS

GARDENA, Calif. – American Honda, the U.S. distributor of Honda cars, motorcycles, power products and related accessories, cut five days off the time required to place parts shipments from Japan into stock by switching from a manual tub file system of managing its reserve inventory to an on-line data base management system (DBMS) at a remote-computing service company.

The application programs in the system were developed by McDonnell Douglas Automation Co. (McAuto) and operate under control of IBM's Information Management System (IMS) on a battery of 370/168 computers at McAuto's West Coast center in Long Beach, Calif.

At regional parts centers here and in Moorestown, N.J., American Honda employees use IBM 3270 CRT terminals to access their data bases over a single multidrop line for lower communications costs.

The need for a DBMS at American Honda is better understood by examining the big distributor's operation.

The warehouses are divided into primary storage and reserve storage. Primary storage areas contain picking bins into which fast-moving parts are placed for speedy filling of customer orders. The reserve storage areas are for slower-moving items and for surplus stock of fast-moving parts.

Identifies Location

The software system used helps move merchandise from reserve inventory into primary inventory by identifying – at the time shipments are received – the precise storage location of all reserve inventory items.

These parts arrive in the U.S. from Japan by both ship and plane. The arrival of sea shipments is preceded by a tape file from Japan listing all the parts in the shipment by carton number. This tape is loaded into the American Honda data base on McAuto's 370/168 using a batch loader specially designed for this application.

Air shipments, which are more frequent but smaller than sea shipments, are accompanied by invoices which are keyed into the data base.

After the data bases have been loaded, the parts lists are immediately available to American Honda warehouse employees on their 3270 CRT terminals.

When a shipment arrives at the receiving docks, workers using telephone head sets inform the CRT terminal operators in a bay or loft area overlooking the receiving line what cartons are before them.

At the terminals, the operators display a screen of some 50 items from the arriving shipment's previously stored data base. As each box number is called out to the operator, he touches his light pen to that item. When all items on the screen have been checked off, the operator depresses the "enter" key, and that screen full of data is transferred into a master reserve inventory data base that assigns part numbers to specific warehouse locations. This operation continues until the entire shipment has been inspected and placed into the data base of reserve inventory.



Earphones and light pen aid checking of American Honda supplies.

At the same time, another sequence of events is occurring. As soon as new items have entered the master reserve inventory data base, the system checks another computer file for possible outstanding requests from the prime warehouse for any of the newly arrived parts. Outstanding requests for parts cause the computer-assigned storage location to be changed.

Printers in the warehouses, connected on-line to McAuto's computers, begin printing out "move" information on labels. These labels, affixed to the newly received cartons by warehouse runners, direct the cartons to their designated storage areas in either the reserve warehouse or the primary warehouse.

Following the warehouse stocking sessions, the master reserve inventory data base is retained on disk at McAuto's data center for daily use by American Honda in moving parts from reserve storage into primary storage. When pickers in primary storage notice that certain bins are either empty or too low to fill an order, they inform a CRT terminal operator in the parts manager's office who enters a request into the system for those parts.

After each shipment of parts has been stored and McAuto has produced a new master data base of reserve inventory, McAuto writes this inventory to tape and supplies it to American Honda's own 370/158 for updating the overall inventory records that feed an order entry system. Through this technique, American Honda dealers know quickly if parts are available in U.S. warehouses to fill customer orders.

Envoy.

The Paperless Portable vs. Portable Paper.

The Paperless Portable is a sleek 26 pound CRT terminal. It looks and acts like an engineer's fondest day dream, but it's as real as the tip of your nose.

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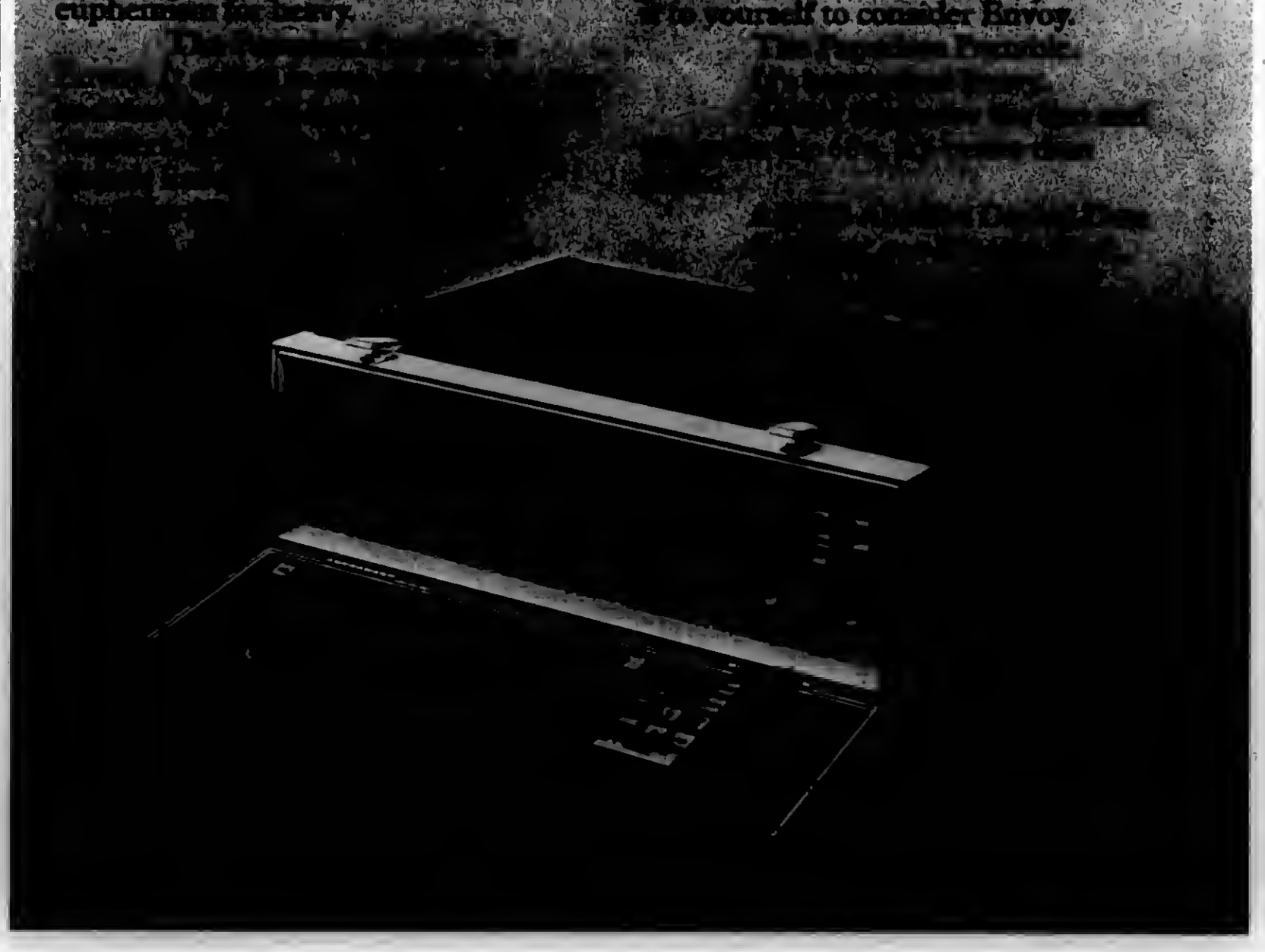
Or he used a portable thermal printer. It too demanded reams of paper, and it still weighed almost 40 pounds. At the end of your arm, portable was a euphemism for heavy.

capability for group presentations.

Unlike the two mechanical contraptions described above, Envoy is reliable. Its solid state electronics can't get out of alignment. And the only noise you'll hear is the faint hum of progress.

Now, as the name implies, the Envoy is paperless. If paper is essential to your operation, you'll have to make do with teleprinters.

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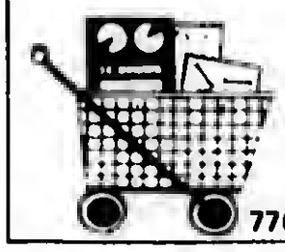
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DRS Machine Change Unknown by Users

(Continued from Page 17)

ming-oriented user to write special-purpose modules to perform tasks related to a data bank and then return to DRS. In addition, the DRS PASSWORD command enables Irma to differentiate access by other agencies to data bases, records, fields and specific commands.

Editing Data

Most Irma reports are used by other agencies; thus data must be carefully edited for clarity and ease of use by non-Irma staff. Irma relies heavily upon DRS for massaging and editing data.

Normal DRS error checking identifies data conflicting with the input specifications supplied DRS by Irma at the time of data base generation. Additional DRS procedures select and generate listings of records missing critical data for further research.

Editing Irma's often lengthy text fields used in service descriptions uses an Arap-supplied link module which enables Irma to modify all or part of a field on one or an entire group of selected records. A key feature of this link module is that only the relevant character string is reencoded.

Conversion of Irma facility files to a hierarchically structured DRS base will also reduce encoding for data entry and editing from that now required for lengthy text fields entered multiple times to that required for encoding the few fields used by DRS for maintenance of the pointers.

In addition, the style guide used by Irma and other agency staff doing research and editing is maintained by analysis of reports generated with the NUMBER command listing the frequency of text patterns contained in key text fields.

Must Meet Public's Needs

Equally important, report production must accommodate the needs of both the pubic and Irma staff. In-house working lists and data "dumps" used in file maintenance are produced regularly.

Special reports, both list and statistical in nature for researchers and planners, are produced in reaction to more immediate, often one-time-only needs.

Irma has produced over 50 hard-copy and microfiche directory sets containing services information.

The Key Word Out of Context (Kwoc) index demonstrates the complex manipulations handled by DRS during the production of an Irma directory or index. The Kwoc index enables the directory user to access facilities and programs by service key words.

An ARRANGE command parses the "words" (defined by Irma at run time, a "word" is a character string delimited by blanks or any punctuation) contained in six relevant descriptive and name fields. These words are arranged in alphabetical order eliminating duplicates generated from the same record. Other unwanted words are eliminated by use of a noiseword table constructed by Irma staff prior to production with the aid of a DRS-generated listing of word frequencies. Next the selected record set arranged in word order passes through a general-purpose link module output formatter (LMOT).

Formatting Language

LMOT is the generalized formatting language Irma uses for all ot its directory production and complex formatting jobs. LMOT is a set of link modules accessed through DRS with over 50 operators for controlling output content and form.

Irma can also insert control characters used in automatic photocomposition as well as interfacing with microform generators.

Gardner is systems manager at Irma in New York City.

First DBMS Project Choice Seen Hard

(Continued from Page 19)

replaced by a more paced ambience. In addition, gross miscalculations regarding system performance or use can be detected and adjusted early, hopefully before results have a wider effect.

The stress on definable modules of system and data base accomplishment should always be coupled with a strong overall emphasis on intelligent and long-range system design. While most DBMS packages "forgive" the user in varying degrees for design or analysis errors, these features should never become an excuse for lack of system investment.

Never Wasted Time

In my own experience, I have never seen a single instance where good solid systems work – an attempt to understand and define in the beginning where and how things are going in the long run – has been time wasted. A few additional man-weeks of effort on the "front end" of a long and eventually complex data base management project can give all concerned a better idea of overall shape and direction.

The single watchword which applies to both ends is "caution." Realistic deadlines for project phases, careful analysis as well as future system functions and sufficient design room for error are all assets as the project goes from stage to stage. As in any other business environment, data processing is measured by its performance: its ability to generate a product on time and according to specification. The cautious approach may not be as flashy a one as employing many high promises to users at the beginning, but the good will and confidence which eventually results when systems work and deadlines are met is a solid asset upon which much can be built.

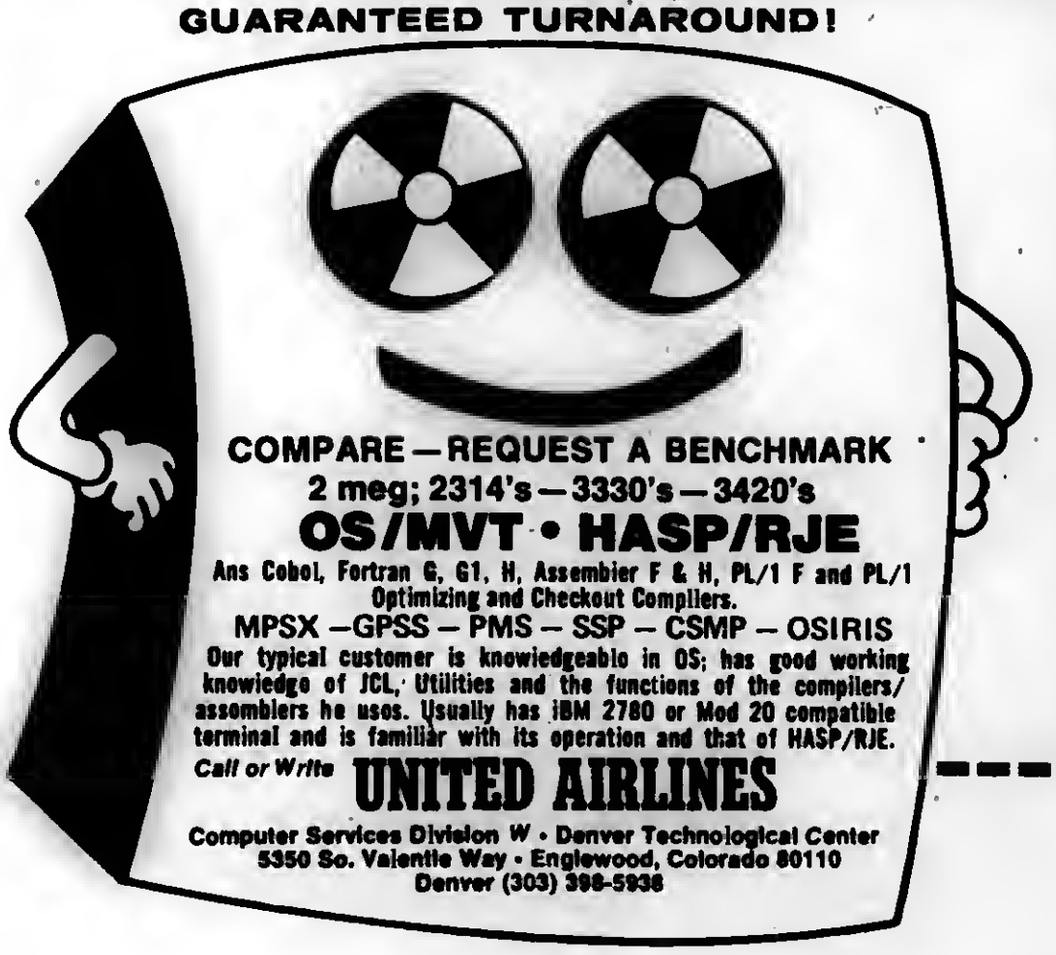
Casey is vice-president of Cullinane Corp. in Wellesley, Mass.

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COMMUNICATIONS

Codex Processors Provide Net Control

NEWTON, Mass. – Codex Corp. has introduced what it described as a new class of data network products, the 6030 and 6040 intelligent network processors. The units are said to combine the best features of concentrators and multiplexers at relatively low cost.

The 6000 series is described as a modular family of compatible data communications processors to implement a range of computer communications networks. The series includes an expandable multiple-microprocessor architecture and an advanced firmware-resident internal protocol to implement these features:

- Replacement of existing communications facilities by network processors is said to be invisible to both computers and terminals. No software changes, modification of protocols or hardware engineering by the user or host supplier is necessary, Codex said.
- Line costs are described as reduced through the use of statistical multiplexing, data compression and a protoeol whieh gives "unprecedented throughput efficiency." Node-to-node delay is typically less than that obtained with conventional time division multiplexers, the company said.
- Data is protected from errors end-to-end by what is said to be a sophisticated integral ARQ technique. Rerouting of traffie around failed links is achieved by alternate and dynamic routing capabilities. Equipment outages are minimized by modular and redundant hardware design and software diagnostics, the firm said.
- From a central site the user or host eomputer can monitor eonditions throughout the network, initiate diagnostic routines and reconfigure network characteristics with the 6030 or 6040. Such network parameters as terminal error rates, processor loading buffer utilization, data compression efficiency, line utilization and others can be measured and reported on the optional operator's console, Codex said.
- The network processors can be configured to span application requirements from simple point-to-point systems on up to large, complex networks having numerous nodal points.

Other Features

Features including autospeed, autoecho, computer port contention, customized data compresssion, data security, synchronous and asynchronous terminal intermixing and compatibility with the Codex 900 series of time division multiplexers (TDM) are available on the 6000 series.

The inltial 6030 and 6040 are available either in table-top or rack-mounted configurations. The 6030 can accommodate up to 124 terminal ports with a throughput rate of 19.2K bit/sec. The 6030 supports options that include network management, data compression, performance monitoring, BSC terminals, synchronous and asynchronous terminals, autospeed, autoecho, an operator console and a control terminal interface.

The 6040 model ean be expanded to accommodate up to 252 ports, and system throughput can be up to 56K bit/sec. Multinode configurations, Codex 900 TDM interface, automatic channel assignment and data security are the options offered on the 6040, in addition to all 6030 options.

First deliveries of the 6030 are planned for January. A typical system composed of 28 ports would be priced at approximately $12,500 or leased at $420/mo. The 6040 will be available next spring. Codex is at 15 Riverdale Ave., 02195.

Telenet, Tymshare Compete for Users' Data Packets

By Ronald A. Frank
Of the CW Staff

PALO ALTO, Calif. – Now that Telenet Communications Corp. has begun to provide packet-switched service to users, new attention is being foeused on a similar service from Tymshare, Inc.

Tymshare's Tymnet packet-switched network went into nationwide operation about three years ago and is now operating through about 112 nodes or access points.

Comparisons between Telenet and Tymnet are difficult because Telenet is a regulated earrier with published tariffs while Tymnet is nonregulated and Tymshare provides the service under contract with customers.

One of the often-quoted advantages of packet-switched services is the user pays only for the data that is actually transmitted on the network. This concept holds true for long-haul intercity charges where transmission costs do not begin until the user has sent data from his terminal to the nearest network node processor. Network costs are based on the amount of data actually sent between network processors.

But users have to find a way to access the nearest processor. If they use a dial-up line, costs begin when they make the connection to the nearest node, or they may use a phone company private line at a fixed monthly charge.

In either case, the cost of the access linc will be based on the distance to the nearest network node. And with 112 nodes already operating, this seems to give Tymshare an advantage over Telenet which initially is serving nodes in seven cities.

Costs of interactive services on Tymnet are about 15% to 20% higher at low speeds than costs charged by Telenet, according to Warren Prince, vice-president for the Data Services Division at Tymshare. But the greater availability of nodes, especially in populated metropolitan areas, means users will probably pay less for access line costs, he said. This advantage will decrease as Telenet brings up more nodes in key areas.

A primary example of the Tymnet advantage in shorter access lines occurs in Los Angcles, Prince said. Tymnet has nodes in the San Fernando Valley, El Segundo, downtown Los Angeles, Orange County and Riverside. These nodes ean be reached for relatively low costs by nearby users. But a call from Orange County to the Telenet processor in downtown Los Angeles could cost as much as $7/hour in long-distance charges, Prince said.

It is very hard to estimate what the Telenet service will cost for interactive applications, Prince said. The price will vary according to the number of characters per packet, and this in turn is dependent on the speed with which thc user enters data into his terminal.

If only one character gets into a packet, the Telenet cost could be as high as $14/hour, Prince estimated. A recent cost estimate of $2.28/hour on Telenet was based on about 15 characters per packet. Another consideration, in addition to cost, is that the larger the number of characters in a packet, the worse the response time is going to be, he said.

Based on Tymshare's experience, the average characters transmitted through the Tymnet network for low-speed terminals runs between five- and six char./sec, Prince said.

In interactive operation, since there is no convenient record length such as a card with which to structure a packet, there must be some rules within the node processor on when to construct a packet from the data the user has loaded into the buffer.

One of the big differences between a Telenet packet and a Tymnet packet is the first ean be sent to only one destiuation while on Tymnet the packets can be sent to multidestinations, Prince said. This means the packet being sent out from the Tymnet CPU on the West Coast can contain answers to inquiries of several network users instead of answering each inquiry with a separate packet.

In the long run, Prince said Telenet will provide a service more suited to the remote-batch user while Tymnet will have better operating characteristics for the interactive user. Despite this fact, Telenet is initially offering only interactive service with remote batch to come later. And Tymnet is making plans to upgrade many of its nodes with larger processors so it can get into the remote-batch area, he said.

Datapoint Adds Hasp Feature

SAN ANTONIO, Texas – Datapoint Corp. has an enhancement to its multiterminal Datashare system that will permit concurrent Hasp workstation batch processing. The program, partition supervisor (LPS), operates under the standard DOS.B operating system and utilizes the Datapoint 5500 advanced business processor with disk units.

The software allows Datashare users to run non-Datashare programs in an interactive batch mode while the system is in use for other applications. Eligible programs include the majority of DOS.B utility routines, a Hasp 360/20 communications package and all Datapoint-supported languages including RPG-II, Basic and Scribe.

Up to 16 users with video terminals can access a Datashare processor and disk files. Each terminal opcrates independently and is provided with a 32K virtual memory space in which to run software for data entry or processing. All files may be shared among terminals and are controlled through the central processor.

At present, the enhanced system will run thc Hasp 360/20 communications emulator package, and other communications packages will be added.

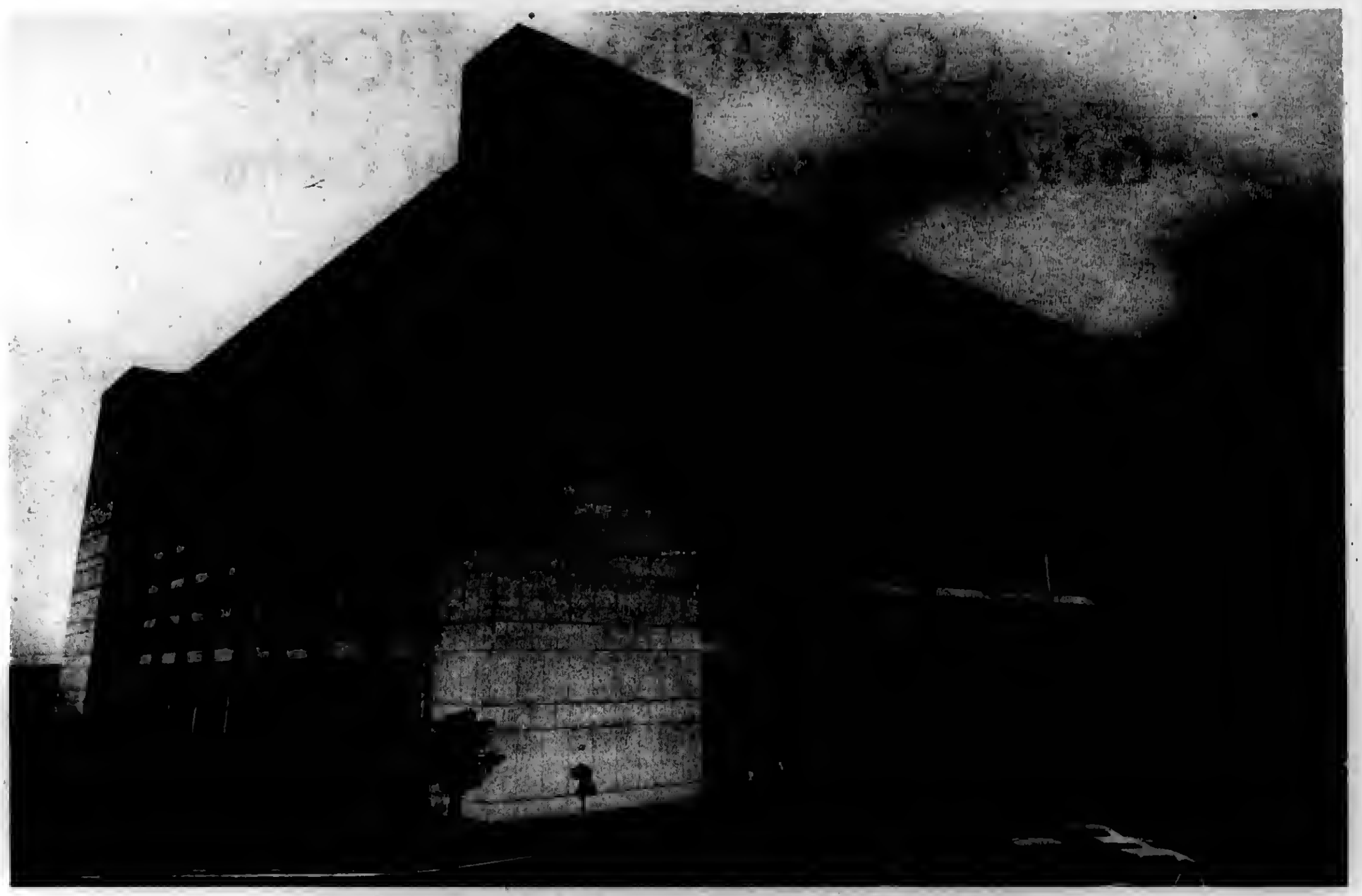
To run thc concurrent proccssing system, a 5500 CPU with 48K of memory is required along with the two 20-million character mass storage disks.

The program is available for documentation charges only, along with a system manual, from 9725 Datapoint Drive, 78284.

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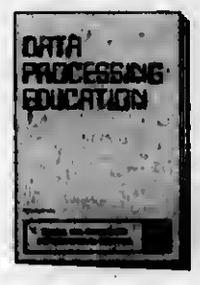
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Memorex 1380 Net Processor Can Replace IBM 270X, 370X

SANTA CLARA, Calif. – Memorex Corp. has introduced a programmable communications processor called the Model 1380.

The 1380 is described as a functional replacement for the IBM 270X and 370X communications controllers, attaching directly to an IBM 360 (Models 30 and above) byte multiplexer channel and/or to a 370 (Models 135 and above) selector, byte or block multiplexer channel. The processor is about 10% to 15% less expensive than a 3705, a spokesman said.

Advanced hardware and software are said to allow the 1380 to provide eight times the throughput of the 3705, offering an aggregate data rate of 100 kbyte/sec. This is the highest data rate of any currently available communications processor in the IBM market, Memorex said.

Because of the 1380's diagnostic and dynamic line-switching capabilities, it reportedly outperforms the 3704/3705 communications processors in network control. The processor offers expansion capabilities and feature enhancements not available with the IBM 270X, 370X or integrated communications adapter such as expandable MOS memory and supports a wider variety of non-IBM terminals, the firm said.

Net Management Functions

Network management functions on the 1380 include dynamic line control, line statistics reporting, line monitoring and down-line diagnostics via an operator CRT console.

The 1380 attaches up to 240 asynchronous lines. It handles asynchronous (start/stop), binary synchronous communication (BSC) and Synchronous Data Link Control (SDLC) lines with line speeds ranging from 110 bit/sec to 230,400 bit/sec in any mix of line speeds, terminals and communications disciplines.

The 1380 has a throughput capacity in excess of 100,000 character/sec for BSC operations and can service as many as four System 360/370 central processor channels simultaneously. Each channel attachment may be equipped with a two-channel switch, permitting attachment to eight individual channels.

Another feature of the 1380 is the inclusion of a flexible disk for program loading (independent of the CPU) and off-line testing. With the communications processor, diagnostics may be performed without interrupting processing.

A typical small 1380 system operating in emulation mode at speeds up to 30 char./sec with asynchronous lines, 32K of memory and a CRT console will cost $1,926/mo on a two-year lease.

A large 1380 configuration operating in NCP/VS mode with line speeds of 2,400 bit/sec to 9,600 bit/sec with SDLC protocol lines, 128K of memory and a CRT console will be $4,780/mo on a two-year lease.

Delivery of the 1380 will begin in the fourth quarter from San Tomas at Central Expressway, 95052.

Adapter Supports Latest Protocols

OCEANPORT, N.J. – Interdata, Inc. has introduced an adapter to interface four synchronous lines between its 16-bit and 32-bit processors and the new data communications protocols.

The quad synchronous adapter (QSA) supports the hardware features of the Synchronous Data Link Control (SDLC), High-Level Data Link Control (HDLC) and Advanced Data Communications Control Procedure (ADCCP) protocols.

One version, priced at $1,600, also communicates with the traditional binary synchronous code (BSC) discipline and can be upgraded easily to a second version, which costs $2,600, and communicates with BSC and the three protocols.

The adapter is a hardware option, contained on a single, 15-in. printed circuit board.

QSA provides the capability of zero bit insertion/deletion and automatic flag insertion/deletion required by the protocols.

Features include modem control capabilities and the ability to modify various character parameters under program control. QSA also provides full-duplex or half-duplex operation and half-duplex interleaving on an individual line basis.

Other features of the QSA are: automatic answering, priority line organization, loop-back line capability, leading sync characters deletion, and automatic parity checking/instruction (BSC).

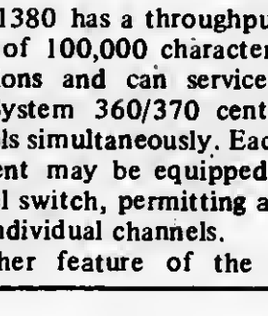
Interdata is also producing a series of line conditioning modules (LCM) which will convert transistor, transistor logic outputs of the QSA to the various input standards.

First deliveries are scheduled for the fourth quarter from 2 Crescent Place, 07757.

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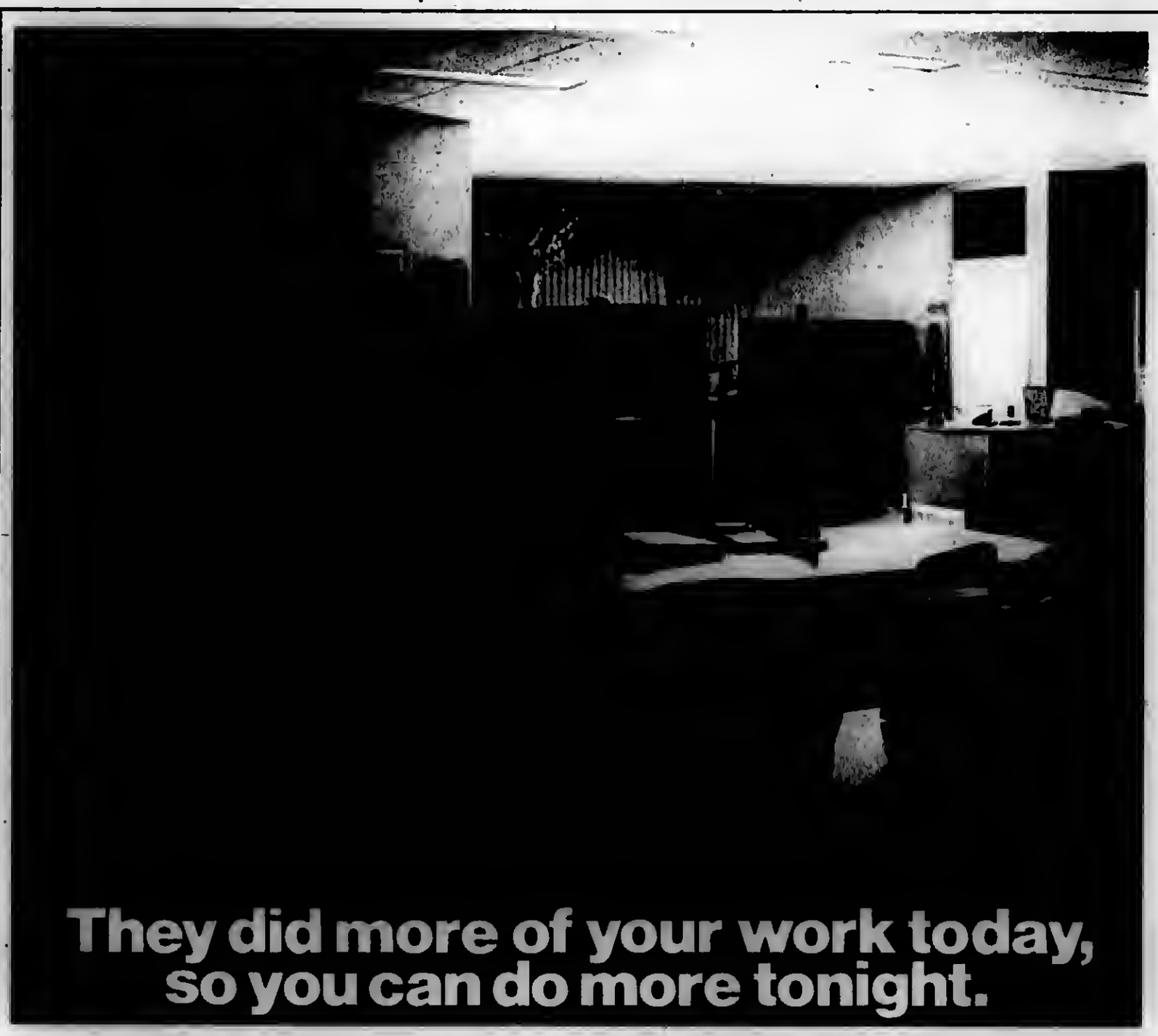
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*Documentation available on request



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Users Beware

Transition From Batch to On-Line System No Cinch

By Ronald A. Frank
Of the CW Staff

NEW YORK – Users fail to appreciate the magnitude of the transition from a batch to an on-line system. In most cases the user has been deluded into believing no transition exists, and the subject is never mentioned in conversations with vendors, according to Salvatore Catania, a staff member at Coopers and Lybrand Consultants.

"You may have a terminal which can communicate, in a fashion, with a distant CPU; but you don't have a system upon which you can safely bet the future well-being of your company," Catania told an Info 75 session.

The user who arbitrarily assumes the transition to an on-line system is easy "throws away his chance to make that transition smoothly," he warned. Since this user never looks for the problems and the pitfalls, he does not see them until after he has installed his system. He then finds, to his dismay, that the system doesn't meet his needs and that he is in trouble.

Most problems facing the new on-line user fall into three categories: availability, response time and the manual system problem, Catania said.

The availability problem arises when the terminal user goes to his unit during the hours of scheduled service and finds the system cannot be used for a variety of reasons.

The response time creates a problem when the answer to an inquiry takes longer than the terminal user can tolerate and still get his work done.

Confusion, Errors

Manual system problems were described by Catania as the confusion, errors and inefficiencies that are caused by those who interface with the terminal to input the information.

To solve the availability problem, the end user's needs must be designed into the system, and the system must be up for a period equal to or longer than the needs of the user. System availability will not automatically equal the end user's requirement unless this is a design criterion, he said.

Many systems define response time as "immediate" but this can be defined anywhere from one second to 20 seconds depending on the expectations of the user, Catania said.

Many times the user does not realize that the transaction processing software, applications programs, file structure, network design, transaction volume and mainframe speed all combine to yield a resultant response time. This problem can't be hidden from the user since every time he hits his input key he is reminded of it, he said.

Manual system problems occur because many times a person completely unskilled and "most likely ignorant of computers is being called upon to develop a close relationship with a CPU," Catania told the session. When cryptic messages consisting of DP jargon are flashed on their CRT screens, these operators cannot be expected to make logical responses in each instance, he said.

To avoid these problems, Catania advised users to design their systems, instead of just installing them. Among the tools to accomplish a successful design, he listed a performance analysis which should then be superimposed on a least-cost analysis.

The vendor will not guarantee the operation level of an on-line system so long as there are other suppliers' products in the network. And it is virtually impossible to get a teleprocessing capability from a single source. So it falls on the user to take responsibility for the total system performance, Catania said.

Failure Reports Boost Efficiency

NEW YORK – Existing telecommunications networks can often be more efficient with the addition of system failure and line-usage reports, according to Charles Waters, interactive systems specialist at Unicoll Corp. Waters spoke at the recent Info '75 conference here.

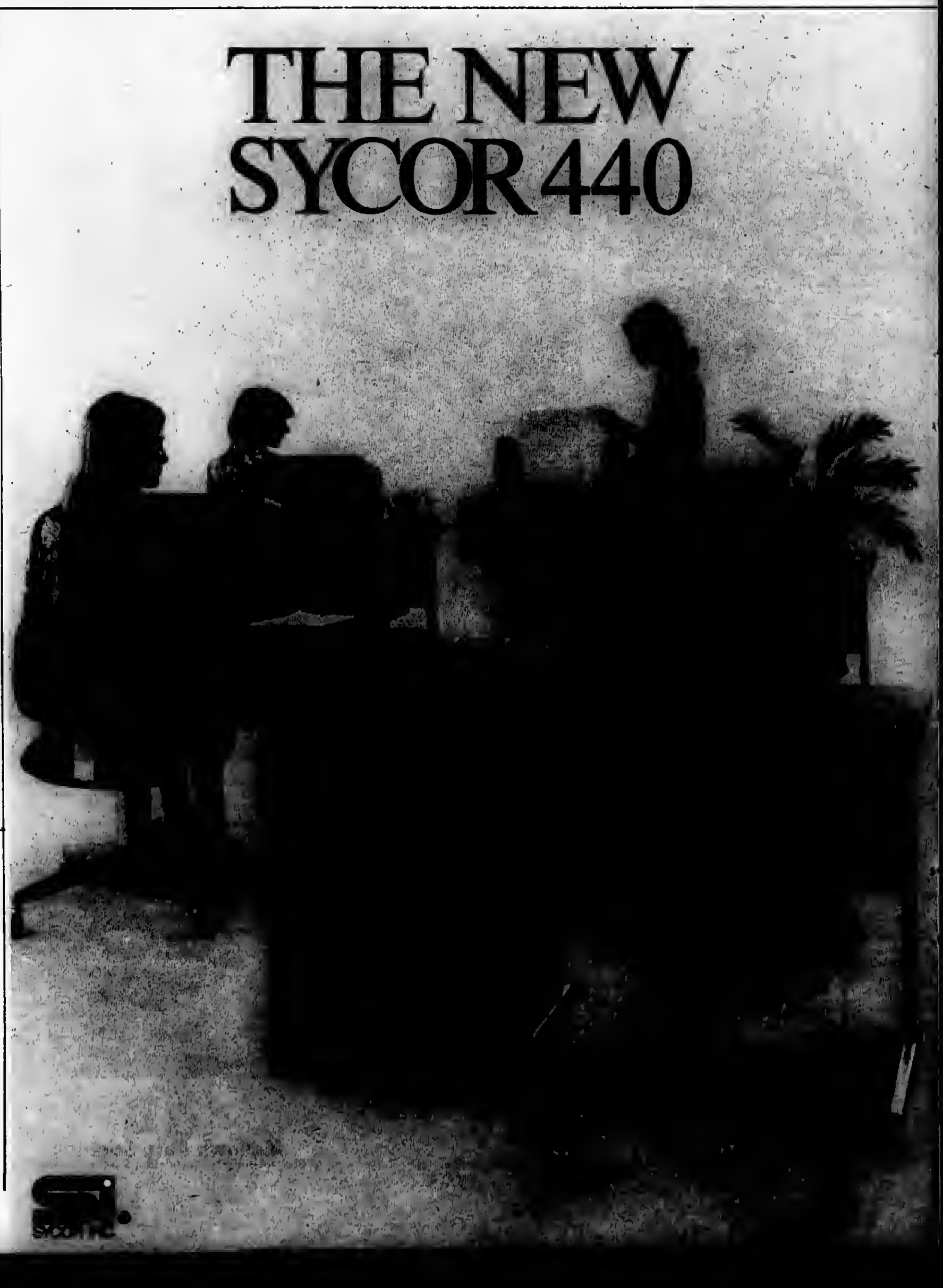
A system failure report includes the time the system is down and the time the system is in operation. It also includes a list of the percentage of time lost, the failing component, a description of the problem and the ID of the operator who was interacting with the system when it went down, Waters said.

Line-usage reports list the description of the line whether it is hard-wired or dial-up, the percent availability, the percentage of actual use and the percentage of retries, he said.

When network outages do occur, the user should make use of a recorded message facility available from most local phone companies. This allows a recorded message to be played on all attempts to access the system. When a remote user hears a description of the problem together with an estimate of the expected availability of the line, it will prevent another call to the DP center to get this information, Waters said.



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Terminal Tied to T/S Network Negates Need for S/3

HUNT VALLEY, Md. – A local company on the verge of ordering an IBM System/3 decided at the 11th hour to use an in-house communications terminal tied to a remote time-sharing service.

As a result, Remac, Inc., explorer, developer and operator of oil and gas wells and coal mines spends less than $600/mo for both its Memorex communications terminal and its GE time-sharing service, located in Cleveland. These costs are approximately half of the System/3 alternative, the company estimated.

The 1280 cassette communications terminal was designed to function with IBM 360s and 370s. However, Remac reported the terminal has proved reliable when operating as a remote device for entering data to and receiving reports from the GE computer center.

Monthly reports required for numerous partnerships, involved in almost 100 wells and several coal mines, and several quarterly reports prepared for each of the limited partners are routinely cycled. Thus, the terminal currently is used, on average, only 20 hour/mo.

"If the occasion should permit it," pointed out Joseph C. Abraham, Remac's vice-president and treasurer who is responsible for the company's data processing, "we can double the terminal's top speed to 120 char./sec with a minor modification."

The data storage cassette feature allows data entered in the terminal to be temporarily stored on the cassette's magnetic tape.

Operators can verify their keyed inputs with hard-copy exhibits and make necessary corrections before incurring phone line charges and computer connect time.

The company also uses the cassettes to store duplicates of the computer programs off premises. Although the chance of GE losing or obliterating one of Remac's programs is practically nonexistent, Remac could, in such an instance, transmit its programs to Cleveland and restore a current data base.

Phone Connects Remac to System

Remac connects to the remote computer by dialing a phone number and placing the phone in a coupler attached to the terminal.

Since the percentage participation by individuals in limited partnerships varies, programs covering analyses of their investments, specifically taxable income, cash flow and investment analysis are run separately. The income analysis delineates sources of income and expenditures to arrive at taxable income (or loss) at various stages of well or mine activity.

Incorporated in the analysis are calculations indigenous to drilling and mining activities depletion. Similar in theory to depreciation, depletion is an accounting loss allowed by law to offset income, an investor tax break to encourage exploration of nonregenerative assets such as oil, gas, coal and minerals.

The firm's continuous reporting to its limited partner/investors not only lets them know of the status of various ventures but allows them a degree of tax planning options well before the end of the taxable year.

According to Abraham, the terminal has proved reliable since its installation late last year.

Spare Back-Up Switch Eases Modem Change

PROVIDENCE, R.I. – International Data Sciences, Inc. (IDS) has introduced the Model 8509 spare modem back-up switch. Utilizing this module, a single spare modem may be switched in to replace any one of a group of on-line modems by operating a front panel switch.

The 8509 is compatible with earlier modules in the IDS Series 8500 EIA switch patch and monitor systems.

Up to four modules may be mounted in a Model 8503-8 module cage and subsequently mounted in a 19 in. relay rack.

Price of the 8509 is $220, and delivery is from stock. The firm is at 100 Nashua St., 02904.

NSC Series 500 Transceiver Operates at 50M Bit/Sec

ST. PAUL, Minn. – Network Systems Corp. (NSC) Series 500 transceiver provides high-speed data communication via coaxial cable at data rates from 1.5M bit/sec to 50M bit/sec.

Six models are presently available, facilitating high-speed digital transmission at a data rate of 50M bit/sec up to 500 feet.

Multiple transceivers can be attached to a single coaxial data trunk. A serial data interface allows attachment of a range of any make equipment, from mainframes to storage devices. Purchase price of the Series 500 is $5,000 with 90-day delivery from 315 North Pierce St., 55104.

Clustered data entry and concurrent processing with shared files...$677 a month.

The Sycor 440 System: the newest addition to our family of compatible intelligent terminals.

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TAL II. To extend the 440's power, use our new data entry language, TAL II. This easy-to-use, high-level language lets you customize data entry programs. Instructions are also provided for arithmetic operations, conditional data entry, range checking, table look-up, equal/compare and a host of other intelligent features.

Shared file access.

The 440 system lets you share and access files locally, reducing investments in telephone communications and central CPU resources.

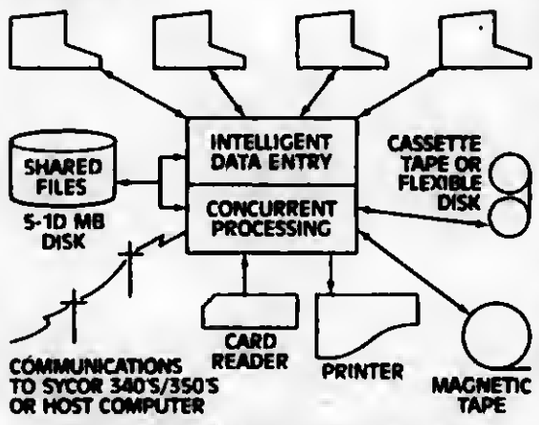
Data entry made easy. Now each operator, at her own display, can make use of current data in shared files to support data entry functions. For reduced keystrokes and lower error rates.

Inquiry/Response. File look-up is made simple with up-to-date information on-site, using the 440's own file management and disk storage capabilities.

System modularity.

Design your own system with a variety of options and peripherals.

Supports from 1 to 8 displays. Each is controlled by the Sycor processor and is capable of performing tasks independent of other displays.



Choice of 5 and 10mb disks. Store and retrieve programs, shared files, and data at remote locations.

Wide variety of peripherals. And to complete our system configuration, choose from matrix and line printers, computer-compatible tape drives, card readers, and a variety of communications options.

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There's full software compatibility with our Model 340 and 350 stand-alone terminals. Keyboards are also compatible.

Programming. One program fits three different systems—340, 350 and 440.

Communications. Communicate with the mainframe, emulating IBM 2770, 2780 or 3780 protocols. Or use the 440 as a polling station at your central computer site to receive and transmit data to remote 340s, 350s, and 440s.

Concurrent processing.

And best of all, while data entry is being performed in the foreground, you can be doing other jobs concurrently in the background. Jobs that can save you time and money. Jobs like:

Remote job entry. Use the 440 with its card reader and 300 LPM printer for large-scale remote job entry. And since the system contains a CRT and a keyboard, you don't pay extra for them.

Multi-terminal printer support. Each display can interleave print data to one printer as the data is being entered. So, you don't need a separate printer for each display.

Report generation. Sycor-provided programs let you produce all sorts of management reports—sales analysis, inventory, or billing—at the same time as you are performing data entry.

File maintenance. And the Sycor 440 allows you to do editing, sorting, updating, and file transfer in a background operation.

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For more information on the new Sycor 440, or any of our other intelligent terminal systems, contact your Sycor representative, or write our corporate offices.

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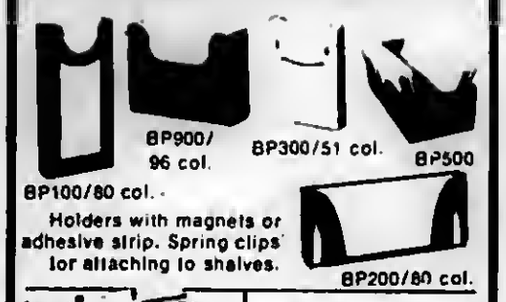
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HP CRT Features Built-in Mass Storage

PALO ALTO, Calif. – Hewlett-Packard has a CRT terminal with 220,000 bytes of built-in mass data storage. The Model 2644A reportedly can perform on a stand-alone basis many operations normally requiring connection to a computer.

Two fully-integrated tape transports, using a miniature version of the 3M Co. data cartridge, are said to provide enough data storage for a day's information. For data entry, forms can be stored on one minicartridge and selectively retrieved in seconds. Program preparation, editing, tape copying, and tape-to-printer operations are within the stand-alone abilities of the microprocessor-controlled 2644A. The unit is called a mini data station.

Protected fields, video highlighting and editing capabilities are included.

The entered data may be stored on a second minicartridge by pushing a button. Later, full minicartridges of data can be batch-transmitted to a mainframe. The 2644A includes a range of microprogrammed instructions.

With these stand-alone abilities, the 2644A reduces on-line time costs, cuts line charges in remote operations and lessens demands on computer resources, the firm said.

Terminal Transactions

Single-Button Functions

Single keys execute the most common tape data transfer commands. Touching any FILE button automatically calls up the appropriate one of the first eight files on a cartridge. Typically these are forms. READ and RECORD are single-button functions.

Two prefix keys are said to speed operations. Input/output functions are assigned by first touching the green prefix key, then the appropriate input and output device keys. Data path architecture of the 2644A is generalized so data may be moved among any of the station's functional units, between cartridge tapes, from the keyboard, to or from the display's semiconductor tapes, from the keyboard, to or from the display's semiconductor memory, to a printer, to or from the RS-232C data communications interface.

A gold key is the prefix for quick access to extended operations. For example, "Gold Key + find file key + file number + cartridge ident key" calls up any of 255 files at search speed (60 in./sec). File records may vary in length from 1 byte to 256 bytes, stored in Ascii or binary format.

In the 2644A, 115,000 bytes of serial information are recorded single-track on each cartridge, using the full .15-in. width of the minicartridge's 140 feet of tape at a density of 800 bit/in. Tape speed is 10 in./sec so transfer rate to or from the display is up to 8 kbit/sec since search is at 60 in./sec, average access time is 10 seconds. One cartridge contains the equivalent of 1,000 feet of paper tape.



HP 2644A Mini Data Station

Same Display as 2640A

The 2644A has the same 5 in. by 10 in. display as the earlier HP 2640A. Within the display, 1,920 characters can be presented in a 24-line by 80-column format. A 9 by 15 dot character cell displays characters. Inverse video (black on white), blinking, half-bright and underlining may be employed in all of a possible 16 combinations. The 2644A can display multiple character sets. A 128-character Roman set, including lower case and displayable control characters, can be used, along with as many as three additional character sets.

A math symbol set is available, and a line drawing set which can be used to generate the user's entry data forms on the 2644A display.

Editing capability is provided to correct data before transmission or recording. Standard features include character and line insert and delete; cursor sensing and positioning; programmable, protected fields for forms; off-screen, solid-state memory storage with scrolling and page-select; tabulation, eight special-function keys for user-defined routines; and a positional memory lock.

The 2644A uses an Ascii RS-232C communications interface and can transfer data from semiconductor memory at rates up to 2,400 bit/sec, (9,600 bit/sec on binary output).

The mini data station is priced at $4,400. Deliveries start in October from 1501 Page Mill Road, 94304.

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A Computerworld Special Report

SEPTEMBER 24, 1975



What is a data base management system?

In simple terms, a DBMS is a cushion between programmer and data, freeing him to concentrate on application logic. The DBMS handles the mechanics of storing, updating and accessing the data, wherever it is in the system, much as operating system software handles the mechanics of managing the computer system resources, creating a cushion between programmer and machine.

A pretty picture perhaps, but what does it mean in fact? What *is* a DBMS?

There are four basic elements: the data base; queries and query programs; physical and logical file organizations; and the data management functions.

The first three elements are essentially conceptual. The fourth serves to realize the designer's intentions, according to Leo J. Cohen, president of Performance Development Corp. (PDC).

Writing in *Data Base Management Systems: A Critical and Comparative Analysis*, Cohen explained that the set of data management functions supplies the utility programs to be executed by the DBMS, to supply the desired data base services to the user.

But many of the packages being marketed as DBMS are very generalized systems, Cohen warned. They are not designed for a specific problem nor are they implemented for a specific machine configuration.

The user must have the skills to tailor the general capabilities to function in a specific setting.

Even though the physical file structure is transparent to the application programmer, the author added, the system designer must realize that the structure will optimize either retrieval or space management, and that one objective is achieved at the expense of the other.

Readers responding to *Computerworld*'s appeal for data on data base [CW, Aug. 27] urged the inclusion of detailed comparisons of currently available DBMS in this report. Frankly, that seems out of the question. Vendors have announced all sorts of new capabilities recently, for one thing. Cohen's book, covering just four of the systems in detail, ran over 200 pages, for another.

But QED Information Sciences, which shared the publishing of Cohen's opus in 1973 with PDC, has recently published another, *DBMS, A Practical Reference* by Ian Palmer, to add to the picture. And Auerbach and Datapro cover the systems regularly.

Several packages are generally regarded as the major DBMS offerings: IBM's IMS (and its subset, DL/1); Cincom Systems' Total; Cullinane's IDMS; MRI Systems Corp.'s System 2000; and Software AG's Adabas.

Though all work on IBM equipment, Total and System 2000 – at least – can also be used in other environments.

And Burroughs, Digital Equipment Corp., Univac and the now-departing Xerox, along with a number of minicomputer manufacturers, all offer data base systems.

Beyond that, there are a number of other packages from independents and they seem to be DBMS or very close to it. The Computer Information Management Co.'s Datacom is in this group and is being marketed along with the Computer Software Co.'s Edos, though it works well on its own under IBM's DOS.

Infodata's Inquire has developed over the years from an inquiry and retrieval system to a full-blown DBMS with the addition last year of a multiple file-handling capability.

Computer Corp. of America has had Model 204 for several years, but has kept a very low profile.

The Software House's System 1022 showed up first on several of the remote-computing networks. Most of the nets now offer a choice of data base systems to meet their clients' varying needs.

The prospective user is faced with evaluation of the available packages, decisions on the first project to be put under DBMS, plans for staff training, the need to learn the techniques of collecting appropriate data, a determination of the proper physical and logical file structures to meet specific project needs and the bookkeeping to keep the data base useful and not overly redundant.

Somewhere in the process – perhaps at several points, for the timing varies from shop to shop – management has to make go/no go decisions. Even if DBMS seemed a great idea at first, these systems may impose too much overhead on some installations, especially those with multiple but clearly unrelated batch-oriented applications that are almost completely sequential in nature and are well-suited for magnetic tape files.

This special report is a mix of tutorial material and user experience. The points made by the various authors may help current and prospective DBMS users put their goals and their systems in better perspective. If so, we're glad.

Checking Out U.S. Experience

Move to DBMS Often Forced by Unavoidable Pressure

By Don Leavitt
Of the CW Staff

The decision to implement a data base management system (DBMS) seems almost forced upon an organization by definite pressures, according to the author of a slim paperback recently published by England's National Computing Centre (NCC).

Very few of thc 21 U.S. user sites visited by a study team from NCC admitted having any doubts about the basic decision, senior consultant Brian Savis said in *Data Base Management Systems: User Experince in the U.S.*

Managers at several of the sites told him it should be obvious whether an organization would benefit from a data base approach. There is a need sensed to find a better tool to solve a set of general problems, and a few of the sites saw integration of data as a significant first goal, he said.

Installations currently considering the use of DBMS will no doubt be disturbed that cost benefits are generally not quantifiable, "although this is hardly surprising at the present state of the art," Davis added.

Davis' little book resulted from inquiries NCC got in 1973 from its members trying to gain insight into the cost justifications of installing DBMS. A rather quick survey of the user base in the UK convinced the center interviews in the U.S. might be beneficial, since there was more DBMS experience in North America.

A team of four investigators – two (including Davis) from the center and two from British Industry – spent three weeks in May of 1974 holding fairly structured interviews with 21 U.S. user organizations.

The installations were to be a reasonable cross-section of typical users, Davis noted, so the team "deliberately avoided many of the large prestige sites."

Packages found in the sites they did visit were "fairly representative of those available," although Davis said he wished the team had found more of Software AG's Adabas and Univac's DMS-1100 users.

Concerned with practical experience rather than technical details and logic of the DBMS packages themselves, the book moves from reasons a data base approach was adopted, the method of approach and the selection of DBMS software through development and implementation into considerations of data base administration.

Users tend to recognize selection of data management systems requires a more rigorous approach than past projects. This was shown by their real interest in the experience of other users, particularly those with similar environments, and by the involvement of both users and management, Davis noted.

In the more successful shops, implementation of a system, once selection was completed, tended to be a very gentle process – "start simple and evolve," the users told Davis.

Detailed long-range planning is not generally very effective even in conventional DP because of the way requirements change during the implementation process. In a data base environment, it is even less effective, Davis said, citing two reasons for this perhaps surprising conclusion:

- Once the timeliness and availability of data is improved, the information processing requirements of the organization tend to change to take advantage of

(Continued on Page S/5)

Indeed, DBMS Has Come a Long Way, Baby

By Don Leavitt
Of the CW Staff

The data base and the various data base management systems (DBMS) are a natural and inevitable outcome of the progressive development of DP techniques, according to Ian Palmer of Caci, Inc. International. Author of *Data Base Systems: A Praetical Referenee*, Palmer said the dcvclopment to data base can be traced through a number of stages.

It started in the mid-1950s with simple applications using serial files that were often nothing but conversions of existing punched card systems. In those earliest of days, there was little analysis distinct from programming; the programmers dealt with each system individually, since there was no general-purpose software.

Once the need for systems analysis was appreciated, it also became evident to some that – because the data was not in computer-readable form – additional systems using the data were now feasible where they had been impractical in a manual environment. And control software began to appear in the form of input/output control systems and basic operating systems.

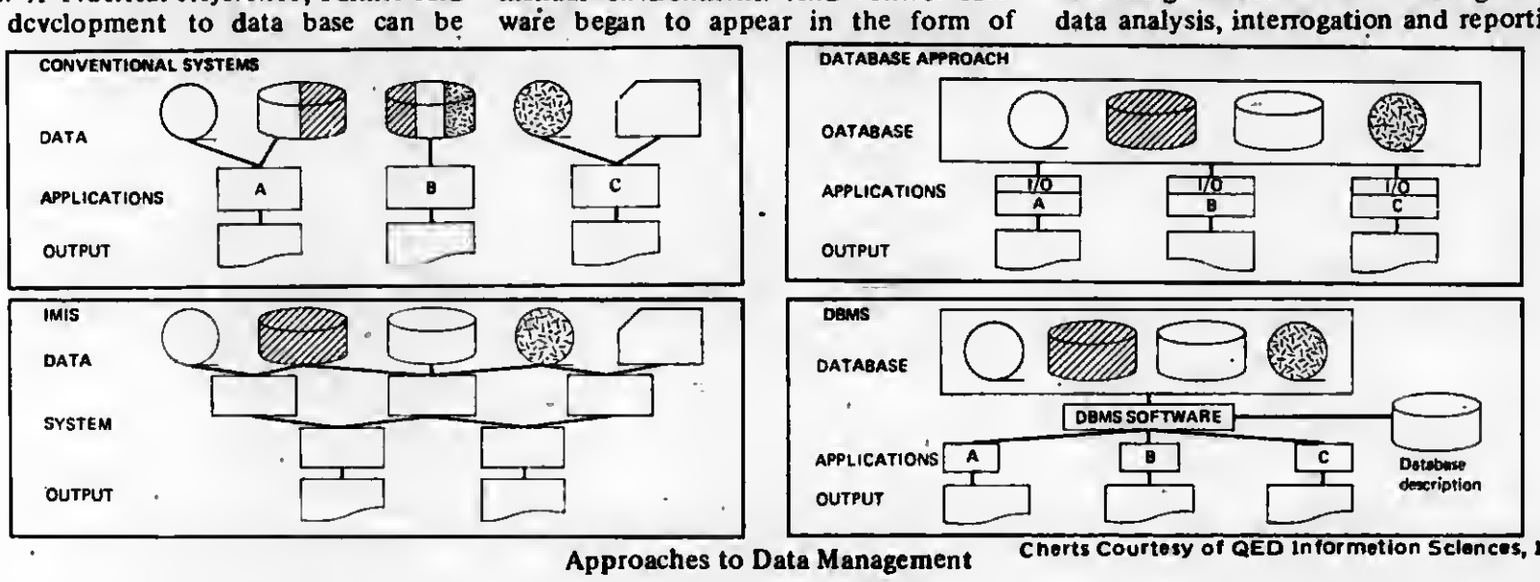
Early in the 1960s, Palmer noted, applications were first implemented as integrated systems rather than as individual processing runs. Much more software was produced, including the first high-level language compilers, but compile times were often so high use of these tools was discouraged.

Further integration of systems started a move toward consolidation of related files. Improved high-level compilers came into use with capabilities such as the Cobol COPY statement that allowed file descriptions to be stored and brought into any program needing the same data. Support for indexed sequential and random files showed up in this time frame.

In the mid-1960s, managers began to see the potential of computers as aids to decision making in addition to being able to handle bulk data processing. This development led to the concept of management information systems, which required more comprehensive data files.

The file structures then available were largely organized to meet the needs of specific applications and that led, in turn, to duplicated and often inconsistent data, Palmer noted.

To ease the handling of these files, specialized software was developed and marketed – including a whole range of "second-generation" file management, data analysis, interrogation and reporting systems. These packages were generally for batch processing and certainly lessened the programming burden for their users in the handling of standard files, the author acknowled.



Approaches to Data Management

Cherts Courtesy of QED Information Sciences, Inc.

Integrated MIS Vogue

At this stage, the concept of the integrated management information system (MIS) came into vogue. This approach, Palmer noted, was an attcmpt at a corporate control system created by relating summary output from a number of applications, each of which was based on its own input data.

The result was a large, cumbersome and fragile system involving many data files, sorts and merges and data moved to the top. The interdependence of such an "integrated" system was often such that if any one file or program failed, the complete system was brought to a halt.

Despite the problems with MIS, integration of files continued and the need for more useful, and inevitably more com-

(Continued on Page S/4)

On the Inside

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File Organization Should Be Matched to Situation S/9
Concept of Data Resource Management Vital to DBMS S/12
Projects Should Gain From Business-Based Analyses S/13

This special report was prepared under the direction of Don Leavitt, CW's associate editor/software.

dbms-10

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Extra Time and Care Needed for Effective Evaluation

By T. Jack McElreath
Special to Computerworld

The first step in the selection of a data base management system (DBMS) is the identification of required eriteria. Required criteria are those capabilities which must be met by that DBMS to fit into your installatioo.

These criteria fall into several different areas. The first area is hardware compatibility. Most installations are probably not going to consider changing manufacturers or upgrading the mainframe of their computer. As a result, the DBMS they select will have to run on their current equipment.

The same is true for peripheral devices, for example, disks as opposed to data cells. It would be expected the DBMS would be supported by those devices. If a heavy investment has already beeo made in a particular type of eommunication device, we would expect that DBMS would support that communication device.

The next area is systems software compatibility. For example, you may be running DOS and may not want to consider going to OS. Therefore, your DBMS would have to run under DOS.

If you are considering teleprocessing, you would expect the DBMS to support the teleprocessing system in which you have already made a large iovestment. You would definitely not consider a DBMS which does not support teleprocessing at all.

Finally, there are interfacing abilities that must be considered. If you are a Cobol shop, you would expect to be able to interface with that DBMS via Cobol.

Subjeetive Evaluation

Once you have identified the required criteria, identify factors upon which a subjective evaluation of the DBMS will be made. Generally, there are five areas of subjective evaluation: vendor support, data security, vendor qualifications, operational environment and technical capabilities.

In terms of vendor support, the first concern is the formal education provided by the vendor. Not only the cost and content, but the availability of the education is important.

Second is documentation. Is the package well documented? Is it provided at a general level as well as a detail level?

Next, what type of maintenance support can you expect from the vendor? What is the level of the expertise of his staff? Is the response time within 24 hours or within a week? Will the vendor provide you with on-site implementation assistance?

This is probably one of the more important areas – unless your staff includes a software expert, it will be very difficult for you to install the DBMS without vendor assistanee.

In areas of data security, you might consider the following. What type of restricted access is offered by the package? Are you restricted at data element level or at the data base level? For example, In IMS the only restriction is at the segment level which is groupings of data. Does it offer good checkpoint recovery procedures? Does It offer a logging feature? Geoerally, a logging feature records all updates against the data base for use when recovering.

Finally, how good are the software diagnostics? If the data base management system goes down with a software failure, does it tell you where it occurred? Or, in the case of a hardware error, are you made awarc that it was hardware?

Evaluate Vendors

With the proliferation of DBMS today, we find many are supported by small software firms whose financial strength is weak at best.

To assure continuing support, the user should evaluate the financial position of the vendor. He should also evaluate the type of experience, both in applications and environment, the vendor has had with his DBMS. If he has had experience in applications and environments similar to your own, it may mean the installation of your system will be that much easier.

Also, does he have plans to revise and enhance the system to keep pace with software technology? An affirmative response will generally give you an indication of the veodors commitment to keeping his software current with other technology.

Considerations here are fairly straightforward. Hardware requirements revolve around the amount of core and types of peripherals you are willing to support, thereby limiting the DBMS to those that fall within your restrictions. You may have data communications equipment already in-house that you would expect the DBMS to support. The samc is true of operating systems.

Technical Capabilities

The final consideration in the area of subjective evaluation is the technical capabilities of the DMBS. A major consideration in this area is whether the DBMS supports a data dictionary. Although the data dictionary feature can be regarded as one of the key features of the DBMS, there are few DBMS that support the fcature.

Essentially, a data dictionary allows you to reference each data element that is containcd within a DBMS, determine what programs access that element, how it is accessed and whether it is updated or merely inquired upon. Whilc a data dictionary is not a necessary featurc of a DBMS, the facility it supports will provide an installation with ease of data maintenance and reference. Considerations should be given to the ease of changing the data basc once it is structured and built and the ease of adding to it as the data grows.

Another important feature of a DBMS is its ability to provide you with performance measurement statistics. As data is added to a data base, the accessing performance deteriorates. As a result, processing times and costs increase substantially. Without reliable performance measurement statistics, it is difficult to mea-

(Continued on Page S/6)

Bad Experience With One DBMS Makes User Cautious in Tests

By Don Leavitt
Of the CW Staff

SAN DIEGO – Know your own situatioo.

Plan – to see if a data base management system (DBMS) would help.

Examine at least a couple of candidates and then test the first choice thoroughly before putting it in a production environment.

Work with the DBMS vendor and encourage the company to work with you.

Almost platitudes, but those rules really work, according to Gregg Locher, assistant data base administrator at Home Federal Savings & Loan Association, where Cullinane's Integrated Data Management System (IDMS) has been under test for the past several months.

So far only the batch-oriented capabilities have been tested, Locher said recently, and it will probably be next year before the communications support has been interfaced and completely tested.

"We're really trying to wring it out and beat it into the dirt as much as possible," he added in a colorful if mixed metaphor.

Home Federal's careful approach seems thoroughly justified. The savings and loan (S&L) Institution has "just about everything" riding on successful implementation of a DBMS in a teleproccssing environment.

The association has somewhere close to 200 IBM 2980 S&L-oriented teletypewriter terminals in 38 branches stretching from San Diego to Sacramento, all feeding into a 360/65 at headquarters here.

Beyond that, Locher admitted, it knows what cao happen if capabilities and responsibilities aren't worked out earefully ahead of time. The IDMS test is the second time Home Federal has tried to come up with a DBMS.

"I can't really say much about it now because it's in litigation," he said, adding the bad experience helped Home Federal discover "just how deeply we have to test it, to wring it out (that phrase again) so we can find out if it's not going to perform before we make a firm commitment."

Sharply Narrowed Field

Against that background, data base administrator Martin Vehanen and Locher sent requests for proposals to three vendors last February. The S&L was able to narrow the field that sharply because it is an installation using the Computer Software Co.'s Extended DOS (Edos) and there aren't many DBMS for the DOS-type environment.

The requests included what Locher called "paper benchmarks" which defined Home Federal's then-current equipment, what the association expected to change and what it was getting in response time with its teleprocessing monitor.

The 360/65 has 512K bytes of main memory and the S&L intends to stay with it for a period of years. "We'll work it 'til it dies, I guess, but may add a little bit more core – a 'bolt-on' unit – or a second CPU for backup purposes," Locher said.

Supporting the 65 are 21 Model 2314 disks but, at the end of this year or early in 1976, the S&L will be going into a conversion to 3330s. The teleprocessing monitor now in use is a home-grown affair, "sort of a modified indexed sequential method, and everything is just super fast, with double buffering, chaining and all."

Terminal operators wait no more than two or three seconds for the first line of response, no matter how heavy the load, "and not much degradation at all is acceptable the way things are going now," Locher added.

Home Federal weighed the proposals it received and signed contracts with Cullinane in April to get IDMS in on a test environment.

The batch-oriented tests have been heavier than conventional DOS shops could throw at a DBMS; with Edos, Home Federal has six-partition support and has been running IDMS in one and the Edos extended spooler in another, leaving four application partitions to exercise the DBMS.

The association is apparently one of the first users of IDMS' "central" facility, which allows one copy of the DBMS to service multiple partitions. Users in the four application partitions have had full access to the data base, including both updating and retrievals, and that kind of

(Continued on Page S/8)

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Vendor Offers Courses, But...

In-House Trainers Seen Best for DBMS Understanding

By Don Leavitt
Of the CW Staff

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Software AG certainly provides training for its Adabas customers, but Robin Gillette, data base administrator (DBA) at Pacific Mutual Insurance Co., feels strongly a using company should not – must not – depend on the vendor for continuing training throughout the organization.

Education of a broad number of people "should not be uninteresting to the data base administrator," he said. "If data is to be a corporate resource – and that is a basic premise of DBMS – you must have more than the small DBA staff involved."

After an initial cycle in which Software AG trains the first line of user personnel, the user staff should run the classes themselves, even though the vendor could continue to do it, Gillette said, adding he saw three basic reasons for this approach.

In the first place, every user environment is unique, he said. Even if two companies are in the same business and have the same DP equipment and the same DBMS, the people and the organizations are bound to be different. And education has to be geared to the people being trained.

More than that, if the user is running his own classes, the format can be changed – often on the spur of the moment – to meet unique situations. The vendor's original subject outline and scheduled times can be extended or compressed if required, Gillette noted.

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To illustrate his points, Gillette noted that, at Pacific Mutual, the Adabas course has been designed to last five days, instead of the three Software AG usually schedules. But Gillette uses only the mornings for lectures, leaving the afternoons free so students can keep track of their regular work and do their data base homework in a normal work environment.

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Needs, Facilities Evolved From Files

(Continued from Page S/2)

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The classic application with this requirement was bill-of-material processing, according to Palmer, and many manufacturers developed generalized software support such as IBM's Bomp package.

The solution to the problems of integrated MIS was seen to be the integration of files rather than of applications. Increasingly, identical or related data was used for more than one application and the result was often conflict between the data storage needs of operational systems and the newer control systems.

The answer to that kind of conflict was believed to lie in the further investigation of data using list-processing techniques, and Palmer noted that, in fact, General Electric released software of this type as early as 1965.

The term "data base" first came into common usage in the late 1960s, he went on. Large firms were finding that, despite enormous and continuing – and that was probably the real complaint – investment in their DP facilities, adequate information was still not available for the control and planning of their businesses.

The volume of data handled was high; the many systems involved lacked coordination; and the costs for systems and programming maintenance were increasing rapidly. Several large firms decided that, because the available MIS and data storage software was inadequate, the solution was to develop their own data base systems.

By the early 1970s, Palmer said, the corporate data base was widely recognized as the desirable approach to DP. With the emphasis on multiple on-line access to make the best use of the data base, the software becoming available was much more advanced.

All major computer manufacturers were committed to supplying generalized data base systems and the terms "data base management systems," "DBMS" and "third-generation data management software" came into use. For the first time, the data base approach became a practical alternative for the majority of computer users, Palmer claimed.

This trend continues, he added, but to be acceptable a modern DBMS must provide more than integration of data, complex file structures and on-line access. The latest software has to have the additional facilities of data base reorganization, data privacy, full recovery procedures and independence of the application programs from the data base.

The current approach to data base technology is the result of progressive development where each step was aimed at meeting problems – often unforeseen – that arose with the then-latest data processing techniques. From an overall computing viewpoint.

Palmer's book was published earlier this year by QED Information Sciences, Inc., Wellesley, Mass.

From Source to CPU

A special supplement on Source Data Entry - in the October 29th issue of Computerworld.

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Administrator Must Have Both Skills and Authority

A data base environment may be broken into three major functional areas: the data base management system (DBMS) software; the users of the data base; and the data base administrator (DBA).

The DBMS comes between the application programmer and the data, much as an operating system comes between the programmer and the computer itself. In any case, the DBMS carries out requests upon the data base specified by the user – more specifically, by the programmer.

The DBA defines the rules which govern control and access of the data and the method of physical storage of the data. He handles this function via a descriptive data base language, with which he can:

- Define and describe the data.
- Define the logical relationship and interrelationship of the various segments of data.
- Define the physical storage of the data and its attributes.
- Define and describe the logical view of the data as it may be seen by the application programmer and the interrelationship of the logical views to the physical data structure.
- Define the security measures applicable to each user and to the data base.

The DBA assigns to each element a unique mnemonic name which will give an indication of the data element's logical meaning. The definition of the logical relationships that exist for the various data types and elements to logical and physical data structures is an additional task of the DBA.

Such a relationship definition is vital if the application program is to be able to manipulate the data it requires. The DBA should also describe through a data de-

(Continued on Page S/15)

Some Benefits Fuzzy, U.S. Users Say

(Continued from Page S/2)

the new situation – in a way that is often difficult to predict.

- The process of implementation leads to a better understanding of the way information flows in the company. This tends to turn planning into an iterative process and "the complexities of the situation mitigated against any other approach," Davis said.

The selection of the DBMS software – only part of the planning process involved in implementing a data base environment – has recently become a much more formal process. Greater attention is now being paid to comparisons of features, performance and resource requirements of competing packages.

As the user base grows, there is more evidence on which to base a decision, the sites told Davis. With the exception of cases where available hardware allows no choice, he found, "there is a definite resistance toward installing the manufacturer's package without having first thoroughly explored all the alternatives."

Little Concern for Standards

At the time of his survey, at least, Davis saw little concern for DBMS standards. "The people we saw were in general more concerned with solving today's problems than in worrying about tomorrow's standards," he noted.

Vendor support or expertise developed in-house would get users around any problems that crop up in future.

Though implementation of data base-oriented applications was seen as requiring a more careful approach than conventional applications, most organizations attempted the actual implementation using their normal procedures, Davis said.

This is probably because the initial objectives were to keep things as simple as possible by minimizing the degree of integration and allowing systems to evolve in the light of experience, he added.

In a few cases, when the scope of the proposed system was more ambitious, the needs for tighter controls and more detailed planning were recognized in the beginning. Typically, however, these needs were sensed and addressed only as implementation progressed.

The simple approach seemed to account for the growing awareness of the need for a data dictionary and performance-monitoring facilities, Davis said. An awareness of the need for reliability and security was made much more apparent by the use of on-line facilities, he added in a typically British understatement.

Type Affects Development

The type of DBMS package used appeared to Davis and his teammates to have a "significant effect" on the development process.

IBM's IMS and packages following the Codasyl data base task group specifications "seemed to require more detailed planning, involve a longer implementation period and a higher level of skill in design staff than did [Cincom's] Total, Adabas and [MRI's] System 2000," the author noted.

Regardless of the package used, Davis noted, virtually all the organizations interviewed had a number of data bases; the majority had two or three, and the maximum number encountered was 11.

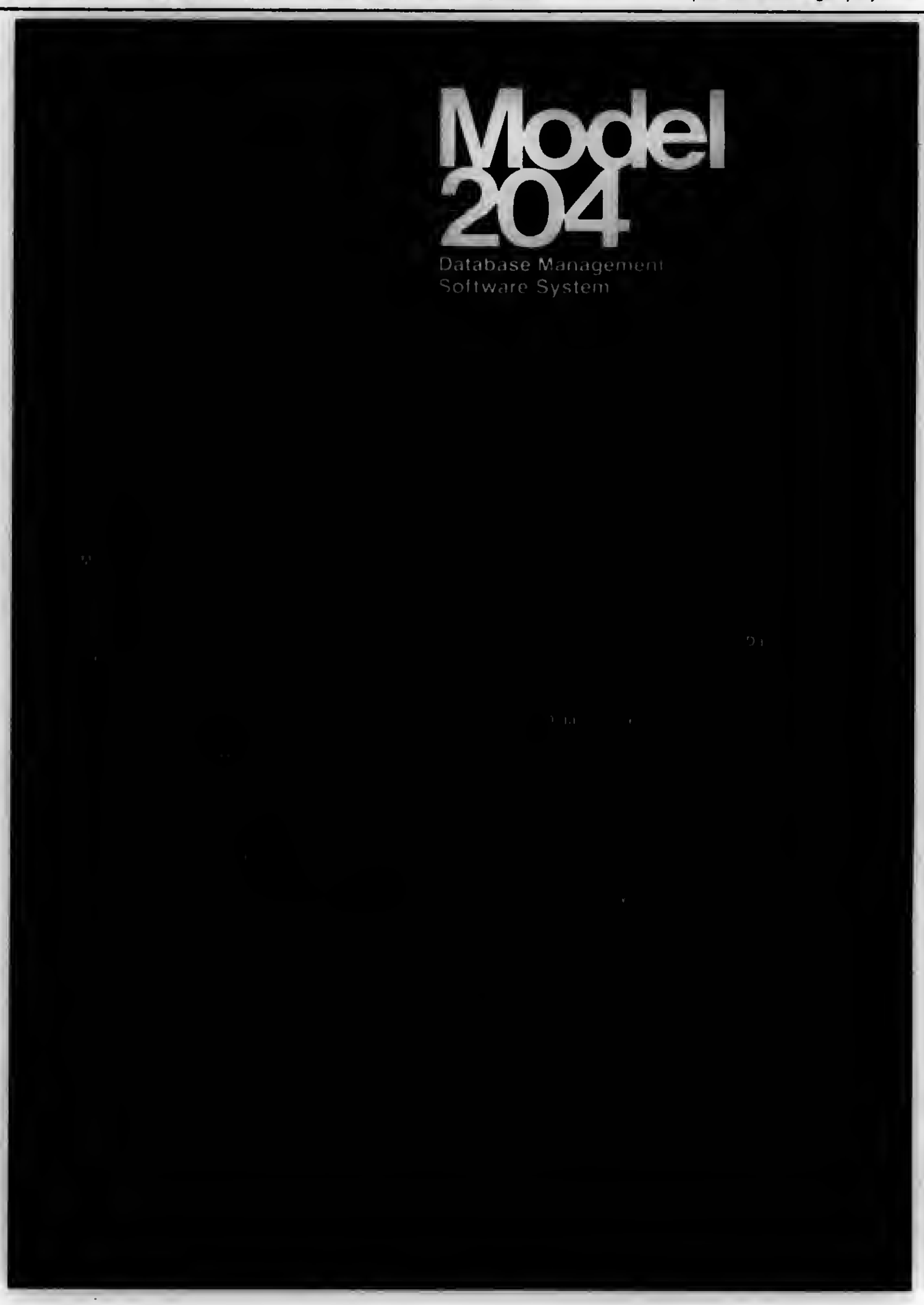
The direct access storage requirements of the data bases ranged from 16M bytes to 2.8G bytes, the majority being less than 500M bytes, the study found.

About half the orgnizations had established a data base administrator and another 25% told the NCC team they felt they would need one in the near future. In general, the functions of the position evolved as the implementation of the DBMS proceeded to involve more and more applications.

The need for the position and the specifications of its functions became more apparent as the process gained momentum, Davis noted.

Although several users saw the need to provide the administrator with executive authority, there were some organizational problems in achieving it. Finding the right person for the job would also seem to present problems, he added.

Davis' book was published by NCC Publications, David & Charles (Holdings) Ltd., South Devon House, Railway Station, Newton Abbot Devon, England. In the UK, it sells for 2.80 pounds.



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The classic application with this requirement was bill-of-material processing, according to Palmer, and many manufacturers developed generalized software support such as IBM's Bomp package.

The solution to the problems of integrated MIS was seen to be the integration of files rather than of applications. Increasingly, identical or related data was used for more than one application and the result was often conflict between the data storage needs of operational systems and the newer control systems.

The answer to that kind of conflict was believed to lie in the further investigation of data using list-processing techniques, and Palmer noted that, in fact, General Electric released software of this type as early as 1965.

The term "data base" first came into common usage in the late 1960s, he went on. Large firms were finding that, despite enormous and continuing – and that was probably the real complaint – investment in their DP facilities, adequate information was still not available for the control and planning of their businesses.

The volume of data handled was high; the many systems involved lacked coordination; and the costs for systems and programming maintenance were increasing rapidly. Several large firms decided that, because the available MIS and data storage software was inadequate, the solution was to develop their own data base systems.

By the early 1970s, Palmer said, the corporate data base was widely recognized as the desirable approach to DP. With the emphasis on multiple on-line access to make the best use of the data base, the software becoming available was much more advanced.

All major computer manufacturers were committed to supplying generalized data base systems and the terms "data base management systems," "DBMS" and "third-generation data management software" came into use. For the first time, the data base approach became a practical alternative for the majority of computer users, Palmer claimed.

This trend continues, he added, but to be acceptable a modern DBMS must provide more than integration of data, complex file structures and on-line access. The latest software has to have the additional facilities of data base reorganization, data privacy, full recovery procedures and independence of the application programs from the data base.

The current approach to data base technology is the result of progressive development where each step was aimed at meeting problems – often unforeseen – that arose with the then-latest data processing techniques. From an overall computing viewpoint.

Palmer's book was published earlier this year by QED Information Sciences, Inc., Wellesley, Mass.

Administrator Must Have Both Skills and Authority

A data base environment may be broken into three major functional areas: the data base management system (DBMS) software; the users of the data base; and the data base administrator (DBA).

The DBMS comes between the application programmer and the data, much as an operating system comes between the programmer and the computer itself. In any case, the DBMS carries out requests upon the data base specified by the user – more specifically, by the programmer.

The DBA defines the rules which govern control and access of the data and the method of physical storage of the data. He handles this function via a descriptive data base language, with which he can:

- Define and describe the data.
- Define the logical relationship and interrelationship of the various segments of data.
- Define the physical storage of the data and its attributes.
- Define and describe the logical view of the data as it may be seen by the application programmer and the interrelationship of the logical views to the physical data structure.
- Define the security measures applicable to each user and to the data base.

The DBA assigns to each element a unique mnemonic name which will give an indication of the data element's logical meaning. The definition of the logical relationships that exist for the various data types and elements to logical and physical data structures is an additional task of the DBA.

Such a relationship definition is vital if the application program is to be able to manipulate the data it requires. The DBA should also describe through a data de-

(Continued on Page S/15)

Some Benefits Fuzzy, U.S. Users Say

(Continued from Page S/2)

the new situation – in a way that is often difficult to predict.

- The process of implementation leads to a better understanding of the way information flows in the company. This tends to turn planning into an iterative process and "the complexities of the situation mitigated against any other approach," Davis said.

The selection of the DBMS software – only part of the planning process involved in implementing a data base environment – has recently become a much more formal process. Greater attention is now being paid to comparisons of features, performance and resource requirements of competing packages.

As the user base grows, there is more evidence on which to base a decision, the sites told Davis. With the exception of cases where available hardware allows no choice, he found, "there is a definite resistance toward installing the manufacturer's package without having first thoroughly explored all the alternatives."

Little Concern for Standards

At the time of his survey, at least, Davis saw little concern for DBMS standards. "The people we saw were in general more concerned with solving today's problems than in worrying about tomorrow's standards," he noted.

Vendor support or expertise developed in-house would get users around any problems that crop up in future.

Though implementation of data base-oriented applications was seen as requiring a more careful approach than conventional applications, most organizations attempted the actual implementation using their normal procedures, Davis said.

This is probably because the initial objectives were to keep things as simple as possible by minimizing the degree of integration and allowing systems to evolve in the light of experience, he added.

In a few cases, when the scope of the proposed system was more ambitious, the needs for tighter controls and more detailed planning were recognized in the beginning. Typically, however, these needs were sensed and addressed only as implementation progressed.

The simple approach seemed to account for the growing awareness of the need for a data dictionary and performance-monitoring facilities, Davis said. An awareness of the need for reliability and security was made much more apparent by the use of on-line facilities, he added in a typically British understatement.

Type Affects Development

The type of DBMS package used appeared to Davis and his teammates to have a "significant effect" on the development process.

IBM's IMS and packages following the Codasyl data base task group specifications "seemed to require more detailed planning, involve a longer implementation period and a higher level of skill in design staff than did [Cincom's] Total, Adabas and [MRI's] System 2000," the author noted.

Regardless of the package used, Davis noted, virtually all the organizations interviewed had a number of data bases; the majority had two or three, and the maximum number encountered was 11.

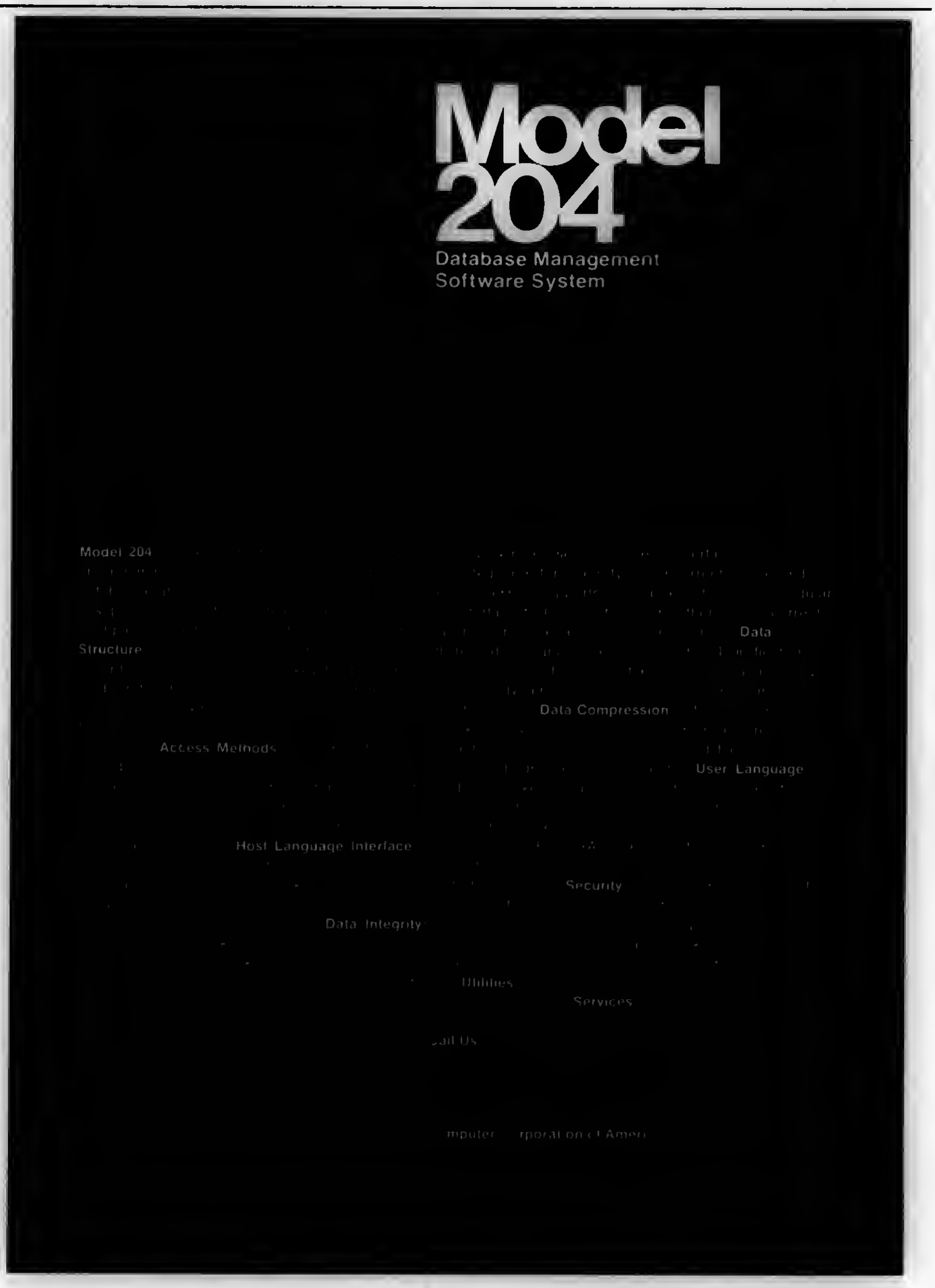
The direct access storage requirements of the data bases ranged from 16M bytes to 2.8G bytes, the majority being less than 500M bytes, the study found.

About half the orgnizations had established a data base administrator and another 25% told the NCC team they felt they would need one in the near future. In general, the functions of the position evolved as the implementation of the DBMS proceeded to involve more and more applications.

The need for the position and the specifications of its functions became more apparent as the process gained momentum, Davis noted.

Although several users saw the need to provide the administrator with executive authority, there were some organizational problems in achieving it. Finding the right person for the job would also seem to present problems, he added.

Davis' book was published by NCC Publications, David & Charles (Holdings) Ltd., South Devon House, Railway Station, Newton Abbot Devon, England. In the UK, it sells for 2.80 pounds.



User-Run Training More Easily Shaped to User Needs

(Continued from Page S/4)

completed the assignment and the course.

That sounds simple, he said, but there are a couple of "hookers" in the project and the student coding has to be done in exactly the right sequence or the lines of the certificate will be generated in crazy quilt fashion.

General Introduction

To bring the students to the point where they know how to code the problem, Gillette starts with a general introduction to conventional DP and to DBMS concepts. He utilizes many of the marketing-oriented slides provided by Software AG, but then adds his own material.

Although the Software AG slides or others of similar quality are very nice, he noted, there are cheaper techniques for putting desirable material into audio-visual form. In particular, overhead projector "foils" can be very effective, since one original drawing or chart can be used to create both the transparency and paper copies of the material for student handouts.

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The amount of detail might vary depending on the students' prior knowledge, but the first day would cover the differences between file-oriented DP, in which the required associative techniques tend to be static, and data base operations, where growth naturally occurs in both the type and volume of data and the user community accessing it.

Throughout the course, Gillette said, students are asked a series of multiple-choice questions, with the hope they will get them right. But there is no penalty for wrong answers; the questions are asked so the instructor knows for sure how the individual student is thinking.

The second day of classes at Pacific Mutual gets the students into the basic capabilities of Adabas and the responsibilities of the users. They begin to learn how to define data, how to load it into fields or records under the data base and the basics of updating and retrieval of information once it has been stored.

The instructor proposes two files, one on people, including individual student profiles, and the other on tasks to be completed during class. With utter realism, these include clear definitions of such things as the coffee breaks scheduled each day, the final exam and the problem task.

A handout describes the student file and the students are shown how to reach in and make changes where needed. The student profiles contained some errors and this day's assignment is for each student to put his own records back the way they should be.

Here again, there is another lesson to be learned. The entire student file is insecure, Gillette said, and students can and do tinker with each other's records. The value of data security is made clear even before the subject comes up in class.

Command Usage

The third day of classroom instruction covers command usage under Adabas and at this point the students are given the start of the program with which they can generate their certificates. This skeleton has the certificate print logic, Gillette noted, but not the code needed to extract the personal data from the student's records.

Day four at Pacific Mutual covers other commands available to the DBMS user and some specifically Adabas-oriented concepts, including the Internal Sequence Number used to locate individual records. Utility functions are discussed at this point, so the student recognizes what the system can and will do for him.

The fifth day adds more detail about Adabas, then swings into a review that encompasses alternative design approaches and specific file alternatives available under this particular data base system.

A final examination is given, and it is graded more at the request of the students' managers than because of the desire of the training team.

The trainers run student critiques, but they know the proof of how much the student got from the course will show up in the success or failure of his own certificate generation project.

If this approach seems somewhat casual, Gillette said, it's because he can't teach the subject by absolute rules. Data base education is gaining an awareness of the trade-offs available; it is not a "this is the way to do it" proposition.

Even users who may never program can gain from attending classes, he said, since – without the training – they often try to design applications without understanding project management. And, in common with so many non-DP types, they do not have specific requirements.

If it's done right, the course taught by people from his own company can help the user bring data base theory and the realities of his functional needs together. Neither the end user nor the DP staff can design a good system unless they know the efficiencies – and the weaknesses – of the DBMS on which the work is to be based, Gillette concluded.

Extra Time Useful For Good Judgment

(Continued from Page S/3)

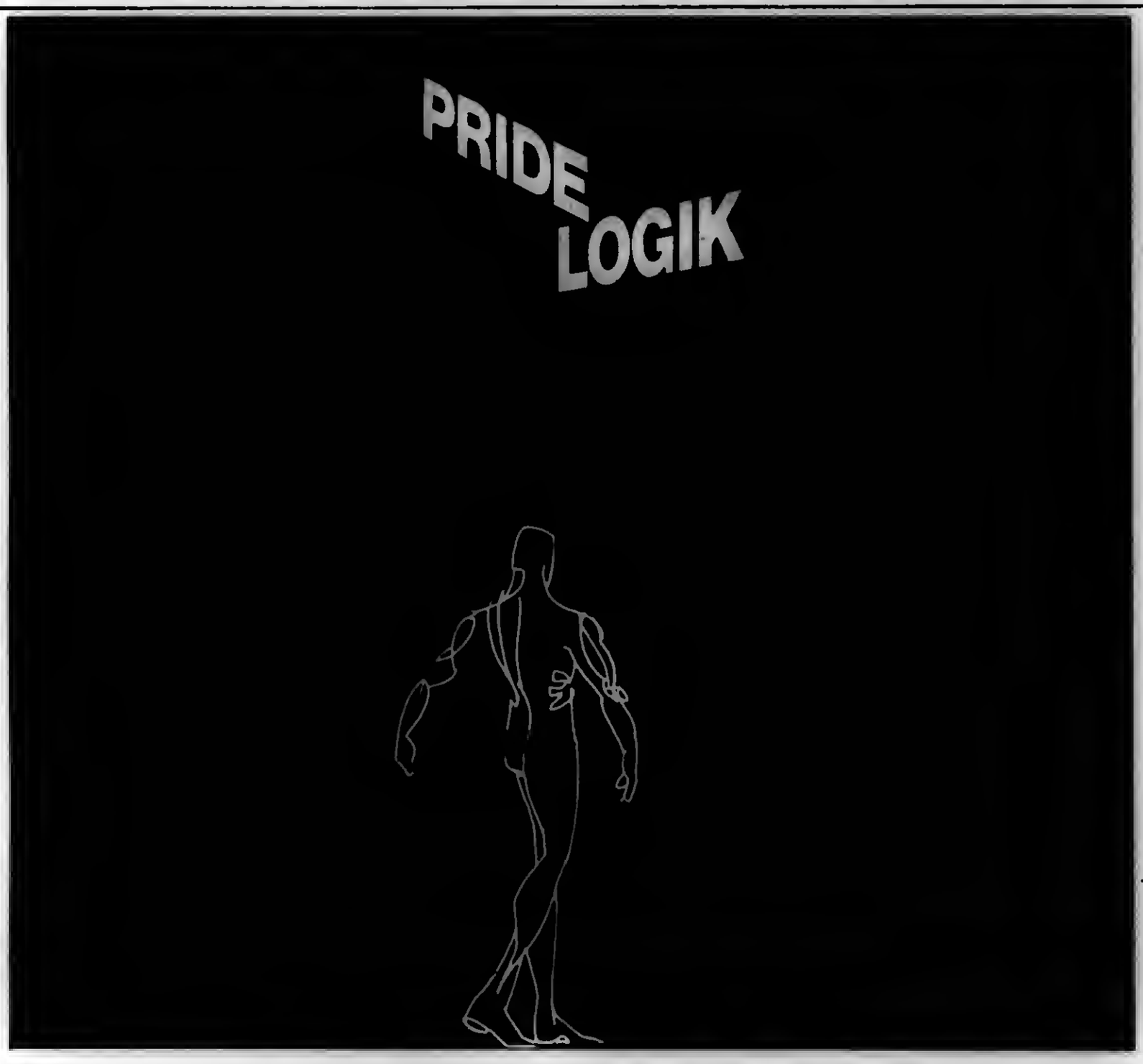
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Finally, conversion aids are important, since one of the largest costs associated with data base will be the process of converting from existing file structures to those supported under data base.

McElreath is a consultant on data base with Keane Associates, Inc. in Wellesley, Mass.



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User-Run Training More Easily Shaped to User Needs

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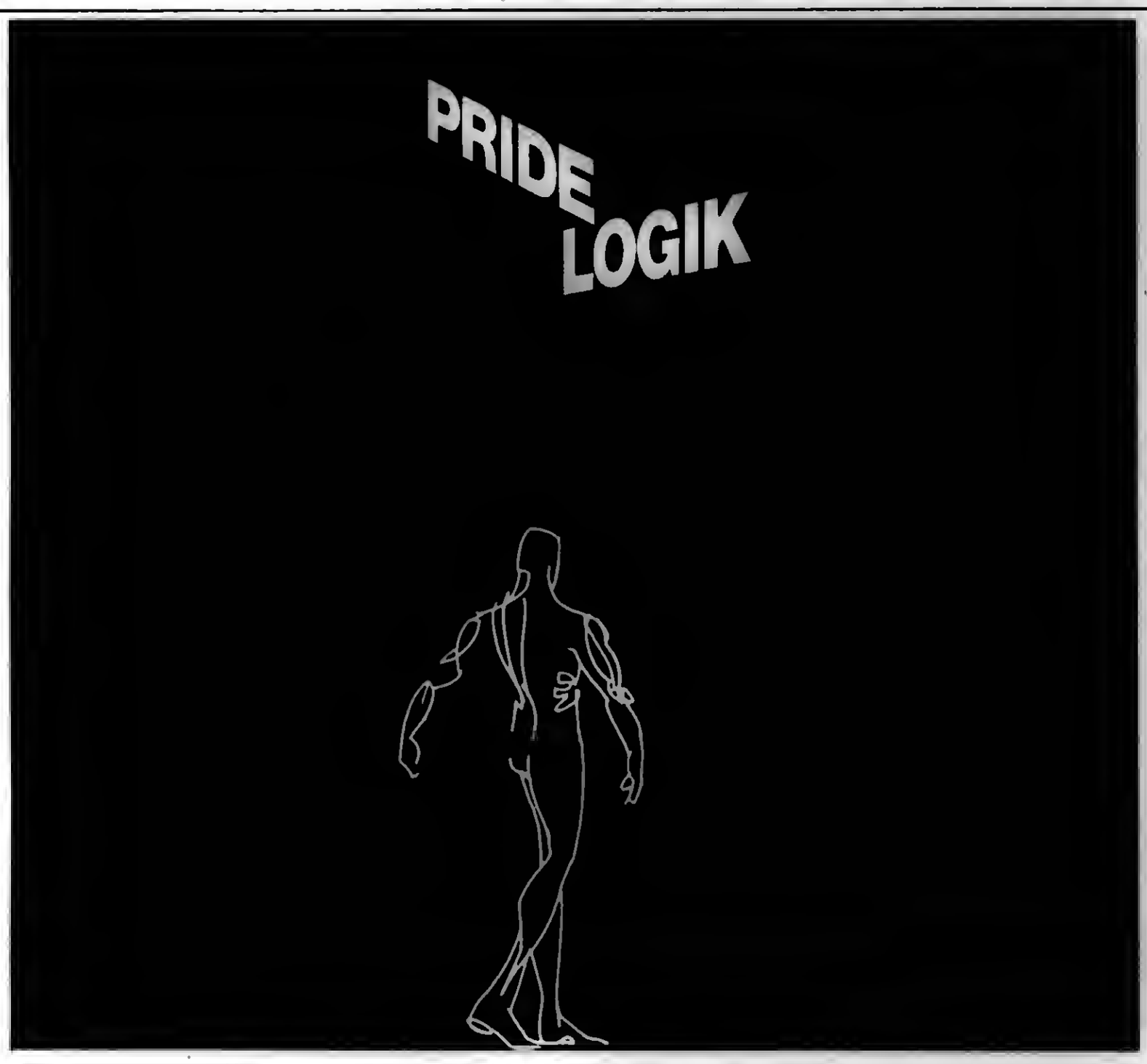
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Studied Capabilities First

Small Staff Handles Switch to 'Total' Environment

By Don Leavitt
Of the CW Staff

CHICAGO – There are all sorts of data base horror stories, but sometimes an installation's experience with a data base management system (DBMS) goes so smoothly it seems like a page out of a press agent's book of ideal stories.

That appears to be the situation at John M. Smyth Co., one of the country's largest retailers of quality home furnishings, where DP manager Joseph Stacey recently implemented his first application under Cincom Systems' Total.

Smyth has nine branch stores in Chicago and the nearby suburban area, as well as its main store on "the Loop" in the downtown area. As in most "big-ticket" retail operations, Smyth realized back in 1973 there was a need to modernize its DP techniques to gain better control of inventory status and customer orders and to speed order processing.

The DP department was asked to study the situation and make a recommendation. Stacey attended a seminar on data base and learned at least something about Total, IBM's IMS and a few other DBMS.

Total sounded like something that would fit into what Smyth wanted to do; it seemed easy to handle and that was important to Stacey.

Though there was considerable sentiment to go to on-line operations for both order entry and inquiry, Stacey's proposal was to hold off on that but go to work with a dynamic data base system.

This approach would, he said, eliminate existing redundancy in the company's data, be flexible enough to tie in other applications and have the capability to convert from batch to on-line in the future if that seemed appropriate.

Problems to Surmount

But while data base was judged the proper key to the firm's new system needs, there were obvious problems to overcome. The DP staff was "modest," Stacey said, admitting it consisted of two and sometimes three programmers in addition to his own activities as working manager.

The in-house hardware consisted of an IBM 360/40 with 128K bytes of main

(Continued on Page S/10)

Caution Marks This User's Tests

(Continued from Page S/3)

load "only slowed down the system a bit," Locher said.

To make centralized service work, he added, Home Federal sent Cullinane a copy of the Edos supervisor with its multitasking capability. The IDMS vendor took it from there, writing the code needed to interface Edos and the DBMS, and Bob Goldman of Cullinane "stuck it in the Edos supervisor one night and it was up and running that night."

There were no Edos people at the site when the changes were made, but that was largely because neither Home Federal nor Cullinane saw any need for help from the other vendor.

The Big Test

With the batch tests all but completed, Vehanen and Locher are turning their attention to the evaluation of the IDMS-teleprocessing combination. That's the big test as far as Locher is concerned.

At the end of August, the two-man data base administration team was in the process of organizing a feasibility study which entails checking through all the coding and documentation of all the programs that will be involved to see, ahead of time, what the impact of the DBMS will be.

If that evaluation goes reasonably, Home Federal should be up and testing in a benchmark environment with IDMS and the current teleprocessing software by the end of October or so, Locher estimated.

If it can't make that timetable, the tests will be forced off until January or so, Locher said, so the association can get through its year-end processing, which is a real bottleneck – at an S&L in San Diego, just as in many other installations.

While Home Federal is studying its teleprocessing logic and the applications programs that use it, Cullinane will be modifying whatever it has to in its Generalized Communications Interface (GCI) to work with the association's "home-grown" monitor. Locher indicated this might require some changes in Edos but, as far as he is concerned, that part of the problem is Cullinane's.

Almost all of the association's customer services are on-line now and will be in the DBMS environment. Applications include savings deposits and withdrawals, consumer loans, home mortgages, loans in process (which is part of mortgage accounting) and "unapplied," which is a catchall for all items that can't be handled directly but which are kept in the system to keep it in balance overall.

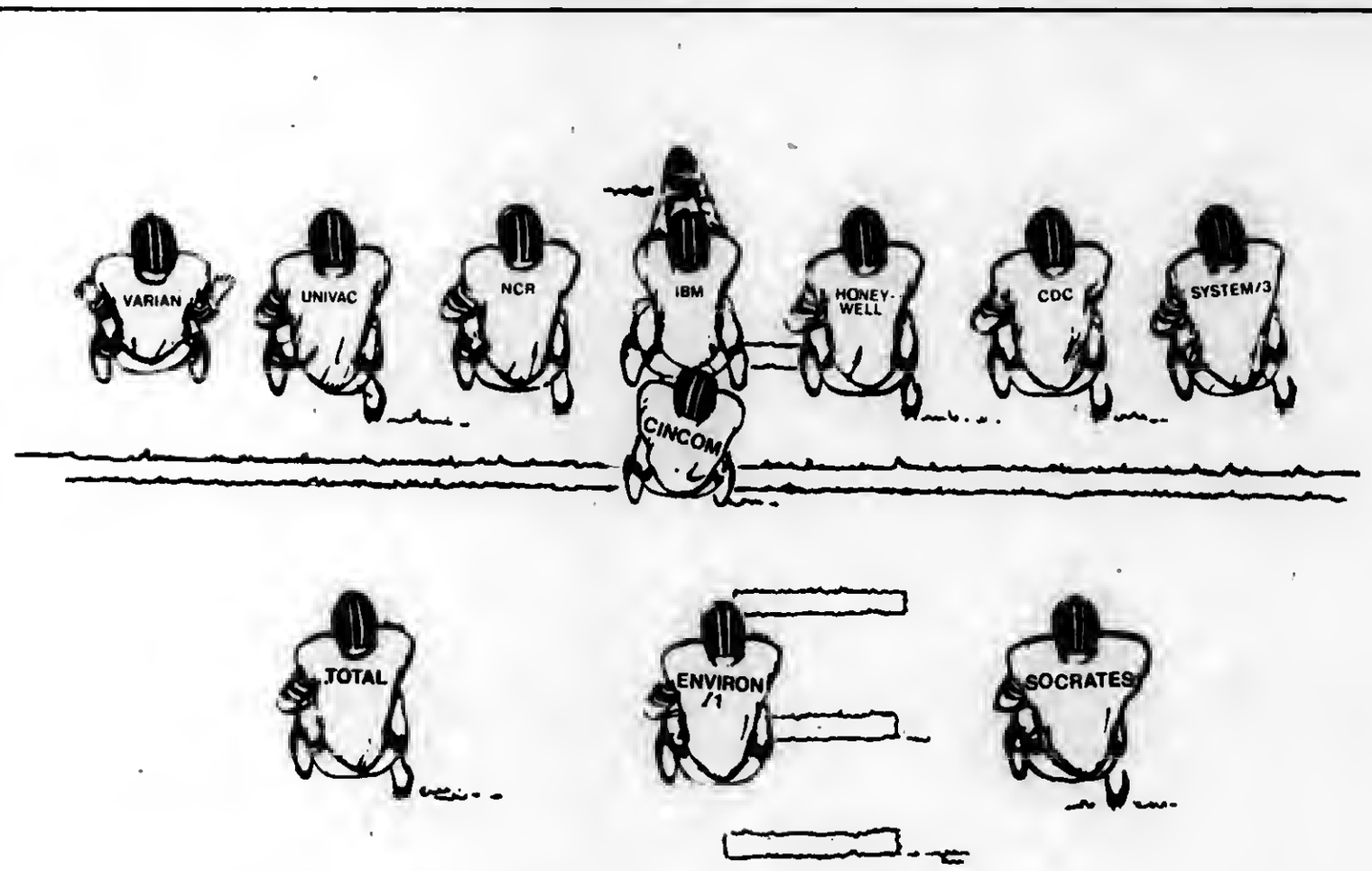
Home Federal is also considering development of an insurance-related application, but that is still quite a way off, Locher said.

Teleprocessing Conversion

Much closer is conversion of the teleprocessing system from being based inside the association's mainframe to being installed in a separate front-end communications processor. The General Automation SPC-16 mini Home Federal expects to use for this purpose has already been delivered and some recoding has been done.

The teleprocessing staff – about five, out of a total technical staff of about 52 – is covering its bets just as carefully as the data base team has. The system will include a two-way switch so that traffic can go through the front end or through Btam processing in the mainframe.

A changeover to CRT terminals is also in the offing, Locher said, but that is something that will only happen "eventually" and has no impact on the currently planned tests.



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File Organization Should Be Matched to Each Situation

By Paul G. Shapin
Special to Computerworld

With the acquisition of a data base management system, the system designer has the power to create a single integrated data base free of all data redundancy.

Now, instead of worrying about how much system integration is possible, the designer must be concerned with how much system integration is desirable.

While integration and the elimination of data redundancy get much play, particularly in sales literature, they are only a means and not the end of systems design. The specific requirements of the system must still be the prime consideration.

For the past 18 months, the Fairfax Hospital Association in Falls Church, Va., has been achieving commendable results in implementing batch and on-line data base systems without creating an all-encompassing data base or eliminating all of the systems' redundancy. The association's data center has been using Cincom Systems' Total as the data base manager and its companion Environ/1 as the teleprocessing monitor.

To date, three systems have been brought up with Total: accounts receivable, patient billing and patient registration.

To Integrate or Not?

The first decision the data center management had to make was whether these systems should use one integrated data base or separate but related data bases. The strongest argument for integration was that the systems used basically the same data and had a close functional relationship.

When a patient is admitted to the hospital, descriptive information about the patient is fed into the on-line registration system through CRTs in the admitting area. In the evening, this same information is passed to the billing system and, shortly after the patient is discharged, the information is deleted from the registration and billing systems and transferred to the accounts receivable system.

In spite of the almost complete redundancy of the patient information in the three systems, it was decided to keep them separate. The primary consideration was the need to make the registration system as efficient as possible.

Once the overall approach had been decided, the individual systems could be designed. The first was accounts receivable.

The primary goal of the design and the reason a redesign was necessary was to reduce the daily runtime, which at six hours was considered unacceptable.

An analysis of the existing system, a modified version of IBM's Shared Hospital Accounting System (Shas), indicated the majority of the runtime was taken up in reorganizing the system's Isam files and in selecting accounts to receive billing statements. The first problem, file reorganization, was automatically solved by the very nature of the Total data base.

The second problem, that of selection for statement printing, required further analysis.

Hospitals differ from many other businesses because only a small part of the accounts receivable (about 20%) are in the billing cycle at any one time. Most accounts are handled by insurance companies which do not get periodic statements.

Of the 20% in the cycle, only 1/21 or about 1% of the whole file is slated to receive a statement on any given day. To find this 1% Shas was reading and checking all 60,000 accounts.

Realizing this, it was decided to link together all accounts scheduled to receive statements on a given day so these accounts could be located more directly.

This design change reduced the daily runtime from six hours under Shas to two and a half hours with Total.

In contrast to the accounts receivable system which accessed a small fraction of the file, the billing system accessed nearly the whole file every night. The need to upgrade the system came not so much because of its runtime (three hours per night) but because of its limited capabilities.

Included in the association's long-range plans is the desire to print bills on demand on-line as patients are being discharged. The existing system was insuffi-

(Continued on Page S/13)

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Three-Man Staff Takes 14 Months to Move to 'Total'

(Continued from Page S/8)

memory operating under DOS with 2314 disk packs. There was no possible way of expanding either the equipment or the staff, the manager noted.

That environment limited the number of DBMS packages Stacey could consider and, by February of 1974, Cincom had installed Total on the Smyth system. That was early, as it turned out, but Stacey wanted it on hand because he really didn't know the timeframe in which he might have programs ready for it.

From early on, the staff used its copy of Total to learn about the capabilities and the demands of the system. Smyth generally used ANS Cobol for programming, oriented around Indexed Sequential files before the switch to data base.

In common with many other installations, Smyth's first application under a DBMS was a mixed affair. The company already had an inventory/order entry system, and the new version included much of the basic logic from that old standby.

Stacey did the basic design work and his two and a half programmers made use of the changeover to do a fair bit of resystemizing. "We had to rewrite everything in it to incorporate all the new things we wanted," Stacey said.

Despite the carry-over of old basic logic, "it was like a 100% change, if you come right down to it," he admitted.

The application programming took about 14 months, but that wasn't a full-time effort since both Stacey and his programmers were involved with maintenance work on the production workload still being handled by the 40.

The approach they used on the inventory control/order entry rewrite involved a very big, segmented program to do the data base updating. It took a year to develop, but that was because of all the transaction types going into it and the logic needed to handle them.

There were no real problems with Total during that development cycle, Stacey emphasized.

Contact with Cincom was minimal, he added. The vendor installed its continuing series of "fixes" and answered phone calls from Smyth – "But I'd be surprised if we made more than five calls all year" – to clear up questions of how to approach a situation or exactly how to handle a CALL statement to get the results the company wanted.

The Total side of the development effort was "very simple," Stacey said, adding that if he and his staff had been working in their "normal" Isam environment, "I think we'd still be at it."

Smyth is using Total 7, the latest version. "There may have been problems with earlier versions, but not with ours," Stacey remarked.

In any case, the inventory control/order entry system went into production status May 1 – "just about on schedule" – and is running fine. Sales records are brought into the data center every night and keypunched – "on IBM 129s. They are really nice machines" – for batch processing.

The Model 40 is not partitioned for this operation. The DOS supervisor, Total's functioning modules and the data base update program take up 100K to 105K bytes of the 128K Smyth has. Stacey estimated he handles 3,500 to 4,000 transactions each night "and that averages about a 16-minute run."

On-Line No Strain

Even while that application is going well, Stacey hasn't forgotten the original goals of the requirements study he made in late 1973. The data base he has created can and will be linked to other applications, and the system has the potential to be converted to an on-line operation without major strains.

Accounts payable processing fits right in with the current operations, he said, and in fact his staff has already built several strings of logic related to that application. The present code is general in nature, Stacey said, but when the decision is made to use it and management decides how DP is to handle specific situations, "all we'll have to do is add a couple of data sets to the base and fine-tune the front-end edit routines."

Matchup of invoices and purchase orders and a system of open buys for the buyer when they request purchase orders will probably be in the new application. A control system for accounts receivable would require a change in two files, he went on, and an updated version of the company's current commission system could be added "in three weeks or so."

Other chores remain on the Model 40 in conventional batch mode, including payroll and "a lot of little hotdog jobs that everyone wants – and no one needs."

These are often special little reports that will ultimately be available under the inquiry capabilities of the DBMS.

No Modest Goal

Stacey obviously doesn't go along with those who feel an installation's first DBMS application should be a modest one. Instead, Smyth's approach was to put "the meat of our operation...the heart of our company" in the new environment first.

He also disagrees with those who feel a DBMS-oriented shop has to have a data dictionary or directory to keep track of what it has on the data base. It may be, he thinks, that some DP managers use an automated dictionary "because it's there," just like some mountain climbers.

On-line capability very definitely does interest Stacey, and he expects to go to Total's companion teleprocessing monitor, Environ/1, though he could not – or would not – put a target date on that part of the DBMS story.

"We definitely want to go that way, with things like merchandise reservations, inquiries about orders and credit authorizations – that's probably going to be our main shot. After that, we'll bring orders directly into the system."

Smyth still feels a lot of indecision on the best way to handle on-line orders. "Do we want to put terminals in the stores – and educate the clerks and others to work with them? Or do we keep the terminals here at headquarters, using them in local mode as an update of keypunching?" Stacey asked.

But the problem isn't as serious as it might seem because Environ/1 is designed to work in either mode. With that in mind, Stacey is satisfied his choice of a DBMS meets all the goals of the requirements study he undertook two years ago.

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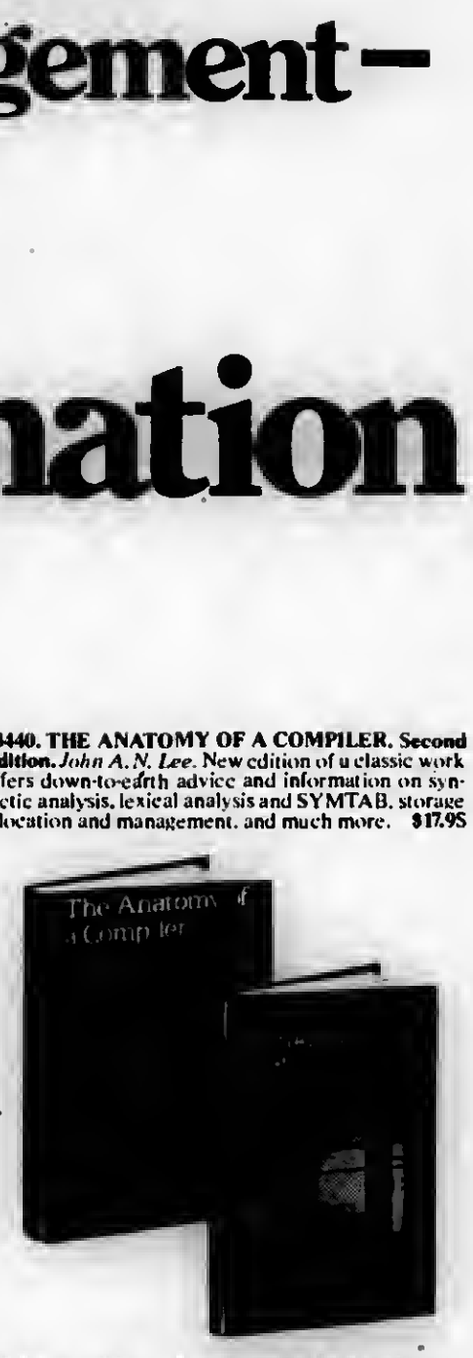
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Concept of Data Resource Management Vital to DBMS

By David Gomes da Costa
Special to Computerworld

Earlier this year, Britain's National Computing Centre published the results of a survey carried out in the U.S., to investigate user experience with a variety of data base management systems (DBMS).

Among the conclusions was a significant paragraph:

". . . . . The evolutionary attitude toward implementation of the DBMS seemed to be a very sensible one; by allowing experience within the organization to grow *from simple beginnings* it should be possible to avoid expensive mistakes, and when problems are encountered the necessary expertise will be on hand to deal with them. . . . . ."

"To grow from simple beginnings" is important, for it reflects what is now an emerging trend both in the U.S. and Europe.

Data is a resource – as valuable to an organization as its more orthodox human and financial resources. Management decisions are based upon the sometimes erroneous assumption that the supply of information is accurate. But information is based on data.

And data, to provide coherent information, must be managed in a rational manner, just as parts in a parts inventory system – an accepted and indispensable system in the manufacturing environment – are also managed. It is from this notion that the whole concept of data resource management radiates.

But how should data be managed? One school of thought suggests DBMS will provide a solution. Another thinks the data dictionary approach is now becoming more acceptable.

In any case, management should be made aware of how indispensable data management is and the information systems department should be given the right tools for the job.

Data Into Information

The function of the information systems department is essentially to turn data into information. While this was primarily related to accounting operations in the past, the horizons are now much broader and encompass a more fundamental role in the area termed the management information system.

In accepting this increased level of responsibility, the information system department must also accept the responsibility of supplying the appropriate information on time, for the value of data to the person or department requiring it decreases with time.

But how well-equipped are most installations to meet this responsibility? How sure are most installations they have full integrity of data?

A change somewhere in a system, a field length for example, can often have unforeseen repercussions on other programs and modules making up that system.

Often management may ask a simple question or request a simple change but because of data inconsistency, the result can cause havoc in the information systems department.

Some widely accepted figures for the UK suggest an average installation spends up to 450 man-weeks a year on systems maintenance. Even an increase in efficiency of only 15% could make for big savings when one considers the real cost of those lost man-weeks.

One path toward better control of an organization's data resource is the establishment of a data base or its next stage, a data base management system.

A DBMS is like a forklift shunting pallets of information around automatically. Once implemented, it does not allow full control to actually see what data is held, how it might be changed or what repercussions such changes might produce.

Data Dictionary

In Europe many organizations are looking at some of the points offered by a data dictionary, a tool which contains data about data in the same way a filing cabinet index holds information about what is held in that filing cabinet.

The data dictionary gives information about data held in the data base or, excluding a DBMS, gives information about the data irrespective of where it is held.

Extensions of a data dictionary's normal facilities can allow full control of data resources. It can be seen to be the foundation stone of a data resource management system (DRMS).

At Management Systems and Programming, we recognized this fact some time ago when developing Datamanager. The central feature of the system is a data dictionary around which revolve a number of facilities designed to give full data control.

At present there are signs that both the UK government and the European Commission in Brussels are pushing hard the requirement that a data dictionary should offer a high degree of portability. That such importance is now being attached to the question of portability is in itself a sign true market requirements are being met.

It is not uncommon for the multinationals, large government departments and universities to have a number of DP sites with a mixed machine shop content. Often they buy through one central purchasing point and it is therefore important that any proprietary software be portable throughout these sites without complex interfacing problems.

For almost the same reason, a user reaching the end of his current hardware range may wish to minimize software problems during the changeover to a possible different computer type. Portability of the software which records the attributes and characteristics of the data may provide a key evaluation criteria in the hardware selection process.

Freestanding Approach

Similar are the problems of companies only part-way through implementing a DBMS. They still have a number of non-DBMS files to maintain and find the inherent inflexibility of a locked-in data dictionary is inadequate; the dictionary is tied in to the data definition language of the relevant DBMS and the need to always run the DBMS whenever the dictionary is run.

For these companies, an external freestanding dictionary would be the answer. Even at its simplest level, such a dictionary can provide information on the data structure of the non-DBMS files, which would ease future full implementation of the whole DBMS.

For software houses developing data dictionaries, the freestanding approach

(Continued on Page S/15)

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Technocrats Can Cause Problems

Projects Should Gain From Business-Based Analyses

By Stephen L. Robinson
Special to Computerworld

The era of data base is here, or is it? The sales figures for the major data base packages would certainly seem to indicate that data base has arrived; but do the data base package sales really reflect data base system development? Are the clients of the data base systems (end users, people who receive reports or query the data base) really happier than in predata base days?

In the course of numerous educational and consulting endeavors, it has become clear that the overwhelming majority of data base package users would have to reply "no" to both of the above questions.

Let's briefly explore some of the reasons for these negative responses and, in doing so, indicate actions to avoid these pitfalls.

A large percentage of the data base systems presently being designed and implemented will be no more useful to the data base clients than the file systems they are replacing. In most cases, this is because the new data base systems are not really data base systems at all, but reimplementations of existing file systems using data base packages to provide the access methods.

Before getting mired in terminology, let us distinguish between:

- Data base – any collection of data elements which are relevant to an organization.
- File system – one way to automate a data base, which is characterized by individual files for individual applications (and consequently considerable redundancy) and very little program/data independence (new programs usually necessitate new files since the old files are inconvenient for any processing other than that for which they were designed).
- Data base system – a data base implemented with minimal redundancy and maximal relatability. A community of data organized to serve a community of users (management as well as operational personnel).

Data base systems are a revolutionary way to organize a data base, not an evolutionary descendant of file systems. Data base systems are designed for shared data; file systems are designed for proprietary data. File

(Continued on Page S/16)

File Structure Must Meet Need

(Continued from Page S/9)

cient because it did not maintain the patient charges in chronological order by date of service.

Because of this requirement, a data base was designed that would allow charges to be inserted in the proper order in a chain of charges maintained for each patient.

The result was that the new system provided for the capability of printing bills on-line at the cost of increasing the batch runtime of the system by one hour.

The requirements of the third system, the registration system, were that the system provide efficient on-line access to the patient master file, produce a variety of batch reports on the in-house patient population and be available on-line for as close to 24 hours a day as possible.

The system thus required random processing to satisfy the on-line requirements and sequential processing to satisfy the batch requirements.

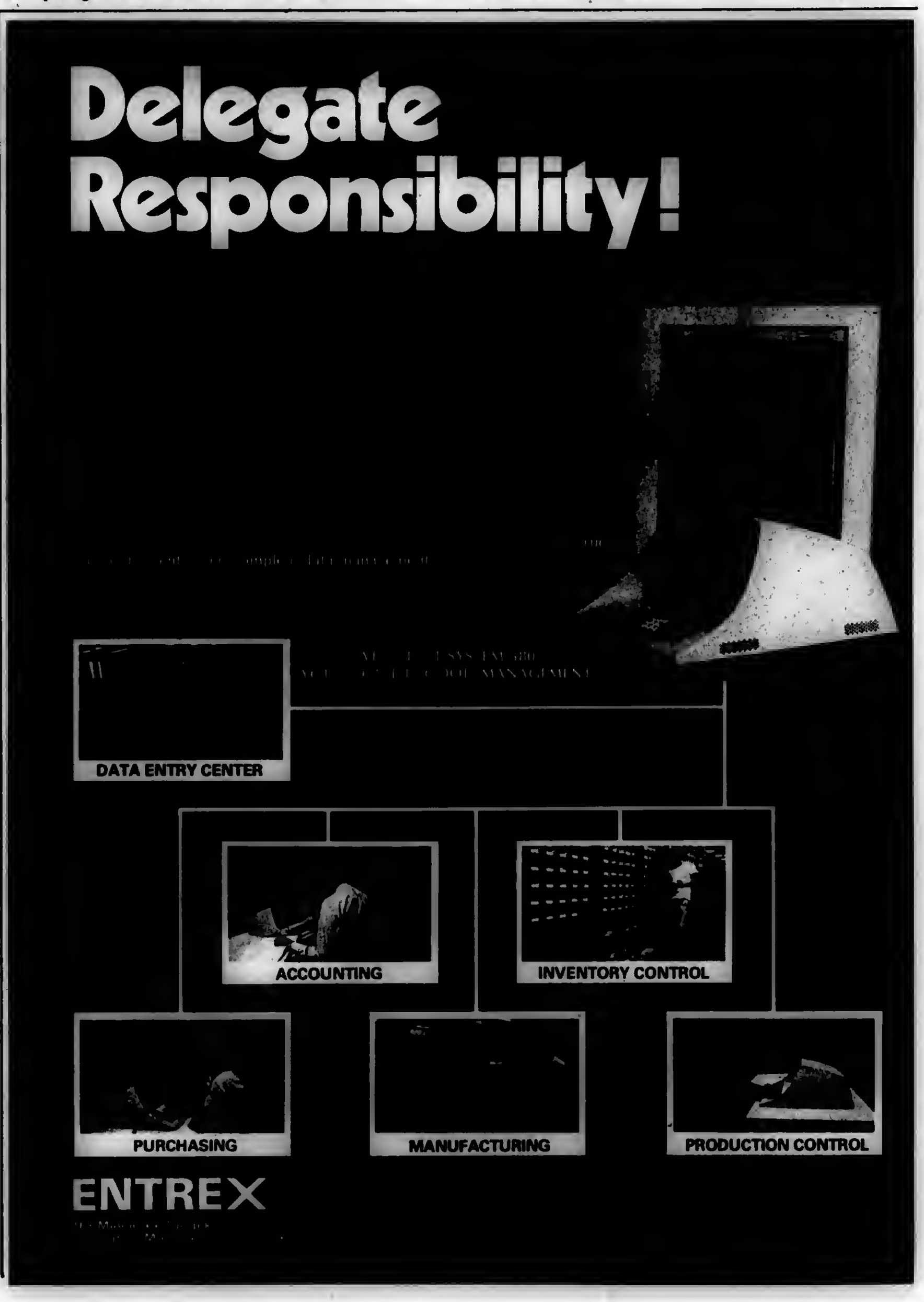
The system design followed a technique that has been used on several applications developed in the data center and by several other Total users. The system was designed to optimize the random on-line functions with disregard to the efficiency of the batch functions.

To handle the batch requirements, a utility program serially reads the Total file and creates a sequential file which is then used in a traditional fashion to produce any necessary reports.

The result of this approach allowed an efficient on-line system to be designed which required the on-line files be taken off-line only 10 minutes a day. Not surprisingly, the batch runtime of the system remained unchanged from that of the sequential system.

In all of the systems the desired results were achieved because primary consideration was given to the specific systems requirements and how the information within the systems actually related, rather than to achieving the abstract goals of total integration or elimination of redundancy.

Shapin is programming manager at the Fairfax Hospital Association Data Center, Falls Church, Va.



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In accepting this increased level of responsibility, the information system department must also accept the responsibility of supplying the appropriate information on time, for the value of data to the person or department requiring it decreases with time.

But how well-equipped are most installations to meet this responsibility? How sure are most installations they have full integrity of data?

A change somewhere in a system, a field length for example, can often have unforeseen repercussions on other programs and modules making up that system.

Often management may ask a simple question or request a simple change but because of data inconsistency, the result can cause havoc in the information systems department.

Some widely accepted figures for the UK suggest an average installation spends up to 450 man-weeks a year on systems maintenance. Even an increase in efficiency of only 15% could make for big savings when one considers the real cost of those lost man-weeks.

One path toward better control of an organization's data resource is the establishment of a data base or its next stage, a data base management system.

A DBMS is like a forklift shunting pallets of information around automatically. Once implemented, it does not allow full control to actually see what data is held, how it might be changed or what repercussions such changes might produce.

Data Dictionary

In Europe many organizations are looking at some of the points offered by a data dictionary, a tool which contains data about data in the same way a filing cabinet index holds information about what is held in that filing cabinet.

The data dictionary gives information about data held in the data base or, excluding a DBMS, gives information about the data irrespective of where it is held.

Extensions of a data dictionary's normal facilities can allow full control of data resources. It can be seen to be the foundation stone of a data resource management system (DRMS).

At Management Systems and Programming, we recognized this fact some time ago when developing Datamanager. The central feature of the system is a data dictionary around which revolve a number of facilities designed to give full data control.

At present there are signs that both the UK government and the European Commission in Brussels are pushing hard the requirement that a data dictionary should offer a high degree of portability. That such importance is now being attached to the question of portability is in itself a sign true market requirements are being met.

It is not uncommon for the multinationals, large government departments and universities to have a number of DP sites with a mixed machine shop content. Often they buy through one central purchasing point and it is therefore important that any proprietary software be portable throughout these sites without complex interfacing problems.

For almost the same reason, a user reaching the end of his current hardware range may wish to minimize software problems during the changeover to a possible different computer type. Portability of the software which records the attributes and characteristics of the data may provide a key evaluation criteria in the hardware selection process.

Freestanding Approach

Similar are the problems of companies only part-way through implementing a DBMS. They still have a number of non-DBMS files to maintain and find the inherent inflexibility of a locked-in data dictionary is inadequate; the dictionary is tied in to the data definition language of the relevant DBMS and the need to always run the DBMS whenever the dictionary is run.

For these companies, an external freestanding dictionary would be the answer. Even at its simplest level, such a dictionary can provide information on the data structure of the non-DBMS files, which would ease future full implementation of the whole DBMS.

For software houses developing data dictionaries, the freestanding approach

(Continued on Page S/15)

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Technocrats Can Cause Problems

Projects Should Gain From Business-Based Analyses

By Stephen L. Robinson
Special to Computerworld

The era of data base is here, or is it? The sales figures for the major data base packages would certainly seem to indicate that data base has arrived; but do the data base package sales really reflect data base system development? Are the clients of the data base systems (end users, people who receive reports or query the data base) really happier than in predata base days?

In the course of numerous educational and consulting endeavors, it has become clear that the overwhelming majority of data base package users would have to reply "no" to both of the above questions.

Let's briefly explore some of the reasons for these negative responses and, in doing so, indicate actions to avoid these pitfalls.

A large percentage of the data base systems presently being designed and implemented will be no more useful to the data base clients than the file systems they are replacing. In most cases, this is because the new data base systems are not really data base systems at all, but reimplementations of existing file systems using data base packages to provide the access methods.

Before getting mired in terminology, let us distinguish between:

- Data base – any collection of data elements which are relevant to an organization.
- File system – one way to automate a data base, which is characterized by individual files for individual applications (and consequently considerable redundancy) and very little program/data independence (new programs usually necessitate new files since the old files are inconvenient for any processing other than that for which they were designed).
- Data base system – a data base implemented with minimal redundancy and maximal relatability. A community of data organized to serve a community of users (management as well as operational personnel).

Data base systems are a revolutionary way to organize a data base, not an evolutionary descendant of file systems. Data base systems are designed for shared data; file systems are designed for proprietary data. File

(Continued on Page S/16)

File Structure Must Meet Need

(Continued from Page S/9)

cient because it did not maintain the patient charges in chronological order by date of service.

Because of this requirement, a data base was designed that would allow charges to be inserted in the proper order in a chain of charges maintained for each patient.

The result was that the new system provided for the capability of printing bills on-line at the cost of increasing the batch runtime of the system by one hour.

The requirements of the third system, the registration system, were that the system provide efficient on-line access to the patient master file, produce a variety of batch reports on the in-house patient population and be available on-line for as close to 24 hours a day as possible.

The system thus required random processing to satisfy the on-line requirements and sequential processing to satisfy the batch requirements.

The system design followed a technique that has been used on several applications developed in the data center and by several other Total users. The system was designed to optimize the random on-line functions with disregard to the efficiency of the batch functions.

To handle the batch requirements, a utility program serially reads the Total file and creates a sequential file which is then used in a traditional fashion to produce any necessary reports.

The result of this approach allowed an efficient on-line system to be designed which required the on-line files be taken off-line only 10 minutes a day. Not surprisingly, the batch runtime of the system remained unchanged from that of the sequential system.

In all of the systems the desired results were achieved because primary consideration was given to the specific systems requirements and how the information within the systems actually related, rather than to achieving the abstract goals of total integration or elimination of redundancy.

Shapin is programming manager at the Fairfax Hospital Association Data Center, Falls Church, Va.

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Administrator, Users and DBMS Have to Work Together

(Continued from Page S/5)

scription language (DDL) the rules by which the DBMS can develop logical data strings from the physical data. The DBA should describe these rules for each application that uses the data base.

The logical data presentation should be composed of logical structures, records and elements. This variety is one of the means by which data independence is provided in a data base environment.

Through the DDL, the DBA should define the various levels of authority a user may be given to have access to system resources, data descriptors and actual data from the data base.

Restrictions and limitations in updating, retrieving, deleting or inserting new values in the data base should be defined by the DBA based on the function of each application.

The mnemonic names of all data elements and their logical definitions should be entered in some sort of data dictionary, which can be a manual operation but is usually run through a data base utility program.

In any case, this dictionary is a vital facility through which the uniqueness and the integrity of the data elements can be preserved.

The physical data organization specified by the DDL and included in the full data dictionary may include record layouts, data set descriptions, data element integrity specifications and physical relationships. This information is used by the DBMS to build a user-defined data base, even though the physical layout of the data becomes irrelevant to the application programmer in a data base setting.

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The independence in the use of the data in a logical application should not be determined – or constrained – by the physical structure of the data. It should be noted that the format, structure and size of the data base and its content can be changed at any time it is needed, and this is done by the DBA with little or no effect upon existing applications.

Recovery Major Concern

In a data base environment, the need for recovering data upon a system failure has become a major concern of all data base designers. Today, in almost all DBMS packages, the system programmer can and should incorporate any facilities available to him to ease such recovery.

The choice of features varies from one DBMS to another, but generally the facilities available include data base load and recovery, data base dump/restore, data base recovery and data base system log analysis. Based on empirical studies, it is recommended implementation and testing of these features should be still another task assigned to the DBA.

One way or another, the DBA should have these facilities available and invoke them in such a manner that they are easy to use and can provide rapid means of restoring a destroyed data base.

The options available to the DBA should enable him to encourage, impose and indeed require a degree of discipline on the part of the users of the data base.

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Management Needed For Data Resources

(Continued from Page S/12)

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Size of market must be the paramount consideration. Dictionary development costs can be high and vendors need large markets in order to amortize these costs. Thus far, for example, development costs for Datamanager have exceeded $600,000.

As companies such as MRI Systems Corp., Cincom Systems, Inc. and of course, IBM push ahead with their own DBMS versions, they are also opening up other marketing areas – areas of potential data dictionary implementation.

They are helping companies focus attention on the consequences of mismanaged corporate data, thereby making companies aware of the need for a DRMS which encompasses, envelops the DBMS.

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These are the major conclusions of MODERN DATA's 1975 survey of the minicomputer, miniperipheral and microprocessor market. The full report of the survey results is now available.

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Questionnaires from over 5,000 minicomputer users at 3,500 sites throughout North America were received and analyzed.

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The complete survey report forecasts total 1975 minicomputer and miniperipheral shipments, and features detailed cross-tabulations, analyses, and profiles for each of the major vendors of minis, micros, and peripherals.

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MICROPROCESSORS

Over one-third of the 3,500 organizations represented in the survey reported an active interest in microprocessors and/or microcomputers. Of the organizations building products with micros, 48% are still in R&D, 31% are still designing, and 21% are now producing. The firms planning to buy micros indicated they will use them . . .

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Instead of minicomputers.....(19%)

For new applications (not previously implemented with electronics).....(36%)

The respondents reported plans to buy 193,000 microprocessors in 1975. The applications and the vendors being considered are tabulated in the full report.

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Business Analysts Would Calm Fears of Non-DP User

(Continued from Page S/13)

systems are designed for individual application efficiency; data base systems are designed for the overall efficiency of all applications which share the data base.

Data base packages provide the basic mechanisms to implement data base systems, i.e., store records, relate records, retrieve records. These basic mechanisms, however, are also the building blocks for file systems. The difference between data base systems and file systems is in the overall philosophy of design, not the implementation tools.

The advent of data base packages has opened the world of data base systems to the vast world of users who were reluctant to attempt data base system implementation on their own. (for a variety of good reasons, including lack of expertise, time constraints, budget limitations, etc).

Unfortunately, the opportunity to develop data base systems is not being seized in most organizations. To some extent, management can be blamed.

Management (non-DP, but oftentimes DP as well) views data base as a package, not as a design philosophy. They are accustomed to purchasing/leasing software, so they fit data base into this niche. Software acquisitions follow standard patterns; the software is installed, the new system is run in parallel with the old systems for a couple of months, and then the new system is on its own.

Management passes the word that the DP department may buy a data base package and expects the payroll system to be running under the data base in three months.

The consequences of such an edict are clear. The only way the payroll system can be running under the data base package in three months is if the files created for the data base system closely resemble (if not duplicate) the files from the present file system. In this manner, the payroll application programs may survive the transition virtually intact.

Subsequently, the personnel system is reimplemented using the data base package. Since the payroll system was designed as a stand-alone, the personnel system designers find it inconvenient to share data with the payroll system. Personnel becomes a stand-alone system.

The data base effort plcks up steam, and the process is reiterated during the redesign of the vast majority of the systems. the result is a file system built with a data base package.

True, there will probably have been some consolidation of files and, consequently, some reduction in redundancy; however, the end result is usually still a file system, not a data base system.

Logical subsets of a corporate data base must be designed in toto before work begins on any of the individual applications. By a logical subset is meant a set of data elements with little, if any, interaction with other logical subsets.

Many organizations are unwilling to invest the initial time and effort required to design a true data base system, or they are not aware of the consequences of such frugality. Such organizations are now paying the price; they are discovering their "data base systems" are not providing more information quicker and more accurately than their old file systems. Some of these organizations are coming to realize this is because they still have their old file systems, albeit in a different form.

Data base administrators must educate management in the difference between data base technology and data base packages. Only then can they justify the effort involved in data base system development.

Users vs. Computer Analysts

The large number of reports in existing file systems, which are filed before being read, bear mute testimony to the schism (chasm might be more appropriate) which exists between data processing personnel and the user community. The source of a large percentage of user dissatisfaction is the computer analyst (program analyst, project analyst or other names employed by disgruntled users).

The computer analyst is usually just that, a computer programmer who excelled at his position and was rewarded by being promoted to what ostensibly is another computer-oriented position, computer analyst.

Unfortunately, the analyst soon discovers the job does not revolve solely around the computer. He is now expected to talk to users and help design systems which reflect their requirements. This is oftentimes not within the analyst's area of expertise or interest.

Rather than admit failure, since programmers may have nowhere to go but into any analyst spot, the programmer/analyst proceeds to design a system employing data storage, organization and retrieval techniques that he deems interesting.

In the past, the result was usually a system which was not what the user wanted, but, thankfully, it was only one system. With luck, some of the file systems were user-oriented, despite the efforts of the program analyst to create a system which he thought would be useful.

Data base technology provides the computer analyst with a plethora of new techniques to experiment with. Full inversions, partial inversions, hierarchies, sets, randomizing; the computer analyst is in seventh heaven.

The users, however, may be worse off than before. A data base system may transcend many, if not all, of the major functional areas in an organization. Consequently, the computer analyst now has an opportunity to create numerous non-user-oriented systems.

What is required is a reinstitution of the job classification of business analyst.

A business analyst is someone who studies business procedures, both automated and nonautomated. In addition, the business analyst works with operational personnel and management to improve the existing business procedures. This activity spans a wide gamut of tasks, from redesigning a form or report to requesting an on-line inquiry system.

The business analyst's first responsibility is to the personnel involved in the business activity under study. It is not necessary for the business analyst to have any DP knowledge beyond that required to communicate effectively with the computer analyst.

Robinson is director of professional development at Performance Development Corp. in Trenton, N.J.

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Nature of Corporation Decides

Centralization or Decentralization: Which is Best?

By Erie A. Weiss
Special to Computerworld

Which are best, centralized or decentralized DP facilities?

There is no clear answer. Economy of scale is the most common argument for centralized DP operations. Advocates of decentralization stress the need to make DP more responsive to the user.

The most important factor in the choice between centralization and decentralization, however, is the organization and management philosophy of the company.

Sun Oil Co. changed from a decentralized to a centralized form of DP activity because the practices, philosophies and organizational principles of the parent company had changed.

In 1968, Sun Oil and Sunray DX Oil Co. merged. The resulting company had 34 computers in 21 locations from Philadelphia to Dallas managed by 15 different administrative organizations.

This approach to DP organization reflected a management philosophy which encouraged decentralized operation and local control of facilities.

Review Brought Change

Immediately after the legal merger, a major review was instituted of the company as a whole and of each major function.

The key organizational recommendation in the systems and computers area was that the company's computer system resources should be grouped together into an in-house service bureau having the responsibility for all computer hardware and all full-time systems analysts, programmers and operators.

The corporate systems manager was to report to a corporate officer. A separate corporate systems planning group was to report to the same corporate officer, and each major operating function should have a separate systems planning group reporting "in line" to its own functional executive.

In addition to the organizational recommendations, the project team made recommendations relating to policies and procedures. It suggested improved processes be developed for selecting and planning projects and for acquiring allocation resources. Another recommendation was that the recommended organization operate under a set of formal, documented policies and procedures. Major functional users should be consulted when computer systems policies and procedures are developed or modified, it also said.

The organizational outcome of this was the Systems and Computers Division. It managed all computing hardware, including selection, acquisition and operation; all systems analysis and development; and all telecommunications.

The dispersed, DP-related groups were drawn together into a single administrative unit. Three parallel efforts were set in motion.

- The exploration of the technical, operational and economical feasibility of combining all the computer hardware into fewer than 21 centers.
- The start of the creation of the necessary policies, procedures and standards.
- The start of the development of processes and organizational arrangements for selecting, planning and carrying out systems development projects.

The firm has reached a consolidated situation today in the form of a wholly owned operating subsidiary of the Sun Oil Co., Sun Services Corp.

Hardware is consolidated into a single site in a specially built-for-the-purpose building in Dallas, completed this July. The movement of hardware into it has been proceeding since then and will be completed later this fall. When it is completed, there will be two IBM 370/168s in a single building. All input/output will be done by remotc terminals connecting to all the locations which use computers.

Benefits Achieved

By this consolidation of hardware, Sun Oil will have achieved a general-purpose environment with calculations of all kinds in intermingled loads on the same computer; central control over the operation of the computer facility as a factory; and physical consolidation of the files, making technically feasible the integration of systems and data bases across various departments and portions of the company. Other benefits include a higher utilization of computers, an economy of scale, reduced redundancy of data and effort and standard procedures and systems. Lower costs in the areas of reliability, physical and data security and privacy protection were also achieved.

In addition to consolidating the hardware, the merger team recommendation involved the centralized control of the systems development function. At first, all systems analysts and programmers were administratively transferred to the centralized Systems and Computers Division.

Then appropriate organizational groupings were made and associated with the users they supported.

Finally, over a long period of time, the policies, procedures, standards and processes required for systems analysis and development, were gradually created and installed.

Sun Services now has a core of policies, procedures and standards which apply to all its activities; which gave interchangeability of data, programs and people; and which generally provide that if a better way is known it is broadly applied.

(Continued on Page 31)

Same Basic Principles Apply To All Kinds of DP Operations

Whether a DP operation is centralized or decentralized, there are certain basic principles that apply, according to Eric A. Weiss, manager of planning and administration for Sun Services Corp.

One of these essential points is that planning, long-range and short-range, must consider the technology, the anticipated changes in the business served and anticipated changes in the DP business. Data processing plans must incorporate user plans.

Also, in deciding whether to implement anything new, management must consider technical feasibility, economic feasibility and operational feasibility. In other words, will it work, will it pay and will it be used? A failure to satisfy any one of these requirements will always result in a failure of the newly installed system, Weiss said.

Remember to include telecommunications if the service must be rendered over a wide geographical range, he added.

Systems development must be seen as engineering, similar in all respects to the design, creation and installation of a plant or a process. It is thus subject to the same kinds of planning, programming and control.

Another point is that the user is responsible for benefits. He must identify the benefits and later be held responsible by management for producing the benefits of the system, Weiss said.

Remember, too, that operation is production. The operation of computers is a factory or production operation and not a research function or a design-engineering function.

Customer orientation is another important consideration. Special arrangements have to be made to focus on the needs and requirements of the customer.

"In data processing we have few standards of the kind which are common and well accepted in the engineering disciplines. We must create many of them and enforce them internally while we wait for the world at large to develop them and the educational world to impart them to students.

"Of these essentials, the first, planning, and the last, standards, are most easily controlled and enforced by a centralized activity. But once they are controlled and enforced, once all important executives and most of the data processing community in the corporation and the user communities have accepted them as essential and necessary, one can no longer use these as an argument for total centralization," Weiss said.

I/O System Links to 360s, 370s

POMPANO BEACH, Fla. – The Mark IV input/output subsystem from Southern Systems, Inc. (SSI) includes a processor/controller that can link up to 23 line printers, card readers, card punches and other peripherals to IBM 360/370 CPUs.

The I/O system's master control unit (MCU) attaches to either a selector or multiplexer channel. Data transfers may occur in the burst mode, control unit forced burst mode or single-byte multiplex mode.

The user adds a peripheral to the I/O subsystem by including a software handler in the MCU and adding a hardware controller. In addition to the MCU operating software, SSI provides diagnostic software for the MCU and each of the peripheral devices.

The standard MCU can support six peripherals, and an expansion module supports seventeen more. The MCU concept allows two or more of the same peripherals to be added to a 360 or 370 CPU, SSI said.

SSI Peripherals

Among the peripherals SSI will supply are 300-, 600- and 1,500 line/min printers; 300-, 600- and 1,000 card/min readers; and a 100- to 285 card/min punch.

SSI also offers a card reader/punch module and paper tape reader modules and three types of CRTs.

The basic MCU controller costs $13,000. The printer prices range from $11,000 to $32,000, and the card readers cost from $4,500 to $8,000.

The card punch module costs $15,000 and the reader/punch module costs $16,500. The paper tape reader module costs $1,500. The CRT modules cost from $3,500 to $7,000.

SSI is at 1011 Southeast Ave., 33060.

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Announcing the EDP Seminar Series Fall Schedule

The world of EDP is caught up in a continuous revolution. It's only 24 years since the first business computer made its appearance, and we've gone from tubes, batch processing and single-site giants to multiprogramming, time sharing, data communications, giant minicomputers and hundreds of other technological innovations that were unheard of only recently. Keeping up with this revolution is difficult, to say the least. And that's why we've created the EDP Seminar Series.

The EDP Seminar Series gives you practical applications of the newest advances in computer management. What you learn will save you time and money, because each course is geared to practical dollars and sense application.

Remember, these are seminars, not lectures, and you'll be learning by doing in a shirtsleeve atmosphere. Workshops are an important feature of the Seminars, and round table discussions and shop talk luncheons complement the seminar presentations. The workbooks and course materials are yours to keep, so you'll always have a handy reference to all you've learned.

We've selected leading experts from around the country to guide each of our Seminars. They are highly accomplished specialists in their fields, experienced in presenting their techniques to industry and management. If you're involved in one of the areas shown, you should attend the EDP Seminar Series this fall. What you learn will benefit your company, your installation, and you.

Data Communications Course #1010 — Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

San Diego	**Plaza Int'l Hotel**	**Sept. 29-30**
New York	**St. Moritz**	**Oct. 13-14**
San Francisco	**Dunfey's Royal Coach**	**Oct. 20-21**
Dallas	**Hilton Inn**	**Nov. 10-11**
Miami	**Marriott Miami Beach**	**Nov. 17-18**

Data Communications Course #1020 — Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Miami	**Holiday Inn Airport Lakes**	**Dec. 1-3**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

New York	**Summit Hotel**	**Oct. 22-24**
San Francisco	**Hyatt Regency San Francisco**	**Nov. 12-14**
Chicago	**Hyatt Regency O'Hare**	**Nov. 19-21**

How to Draft Effective Legal Agreements

This one-day seminar is a complete workshop for non-legal, technical people who may be called upon to draft legal agreements for their company. Also led by Roy Freed, this seminar covers a variety of formal agreements, their structure and the legal factors involved. You'll have all the basic skills necessary to write legal agreements, and you'll be able to spot items that really require the attention of lawyers.

Cost for the seminar, including luncheon and a complete workbook on the subject, is $135.

New York	**St. Moritz**	**Oct. 8**
Boston	**Sheraton**	**Oct. 15**

Data Base Design

Given in association with Leo J. Cohen and Performance Development Corporation, this three-day seminar is a package-independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimum File Organization/Indexing Techniques, File Integration, and much more.

Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300.

New York	**St. Moritz**	**Sept. 22-24**
Denver	**Denver Hilton**	**Dec. 1-3**

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and Interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

New York	**Summit Hotel**	**Sept. 29-30**
Wash., D.C.	**Marriott at Wash. Int'l. Airport**	**Oct. 20-21**
Chicago	**Hyatt Regency O'Hare**	**Oct. 27-28**
San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams.

Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

New York	**St. Moritz**	**Oct. 6-7**
San Francisco	**Berkeley Marriott**	**Nov. 10-11**

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System Shortens Registration Process at University

YOUNGSTOWN, Ohio – Students registering at Youngstown State University this fall can get the job done in a matter of minutes instead of standing for hours in the traditional long lines.

The registration system, which employs a combination of data processing equipment commonly found at large campuses, accepts or rejects the course program proposed by the student, files the accepted program information in disk storage and later generates the billing to the student.

"We developed our system so our 14,000 students, many of whom commute from the suburbs and who work, could complete registration in one expeditious visit to the campus," according to David W. Beede, Youngstown's assistant director for computing services.

One-Day Registration

Students who have been cleared for registration beforehand by mail are invited to register on a day scheduled according to how close they are to graduation. Earlier registration is given to upperclassmen so they are better able to get into required courses before they are filled.

At the registration center, the student produces a completed scan sheet which contains, in the form of blackened-in spaces, the code numbers of the courses he wants to take and his student identification number.

An optical scanner reads the form and conveys the information to the school's IBM 370/145, which, referring to the student's file in Memorex 3670 disk drives, makes several critical determinations.

For example: is the student allowed to register at all or is he suspended; do the courses selected conflict with each other in terms of time, and is the course already filled?

Hard-Copy Printout

If none of these or other problems exist, the student receives a hard-copy printout confirming his completed registration, which takes about 20 seconds altogether.

If there are problems, a CRT terminal nearby is available to investigate the errors (indicated on the printout) that have barred the registration from being completed.

The system is a real-time, interactive one, so that if a student is suspended, for example, and a dean determines the student should be reinstated, the change to the records can be made in moments using the CRT terminal to update the file.

Youngstown State University has not only automated the registration process, but is using its DP facilities for many other tasks, ranging from scientific research to payroll to making time available to local charities.

To perform these extensive DP services, the overall system includes eight disk spindles, each containing 100M bytes of information.

Use of the independent disk drives, which replaced IBM equipment, gave the college "a third more storage space for the same money," Beede said.



Youngstown State College uses Memorex 3670 disk drives to provide storage for the school's on-line student registration system.

Centralized DP Best? Depends on Company

(Continued from Page 29)

Comparing the situation in 1975 with 1971, total productivity is up 55%. Total costs are level in spite of this increase in throughput and in spite of inflation. Total staff is down by 11%. On a cost basis, consolidation has been beneficial.

The consolidated organization had an overall 1974 budget of $14 million and 655 employees.

No Further Consolidation

As a consequence of consolidation and centralization, Sun Services has now reached a point at which there is no further consolidation of hardware indicated and in which it has sufficient control over the systems analysis and development programs so that it can look toward a shift in approach to other kinds of systems, with the following opportunities.

- Enlarged options for systems designers, including virtual storage, the data base and remote job entry facilities of IMS.
- The data transmission network can be used to communicate both with the central site and with other sites on the network through the central site.
- Multiorganizational systems and multiple use of individual data bases.
- With data terminals connected to the central source, on-line access to the central files.

As for the future, Sun Services expects to see a system of large central computers connected to a distributed network of smaller local computers and input/output terminals which are also interconnected.

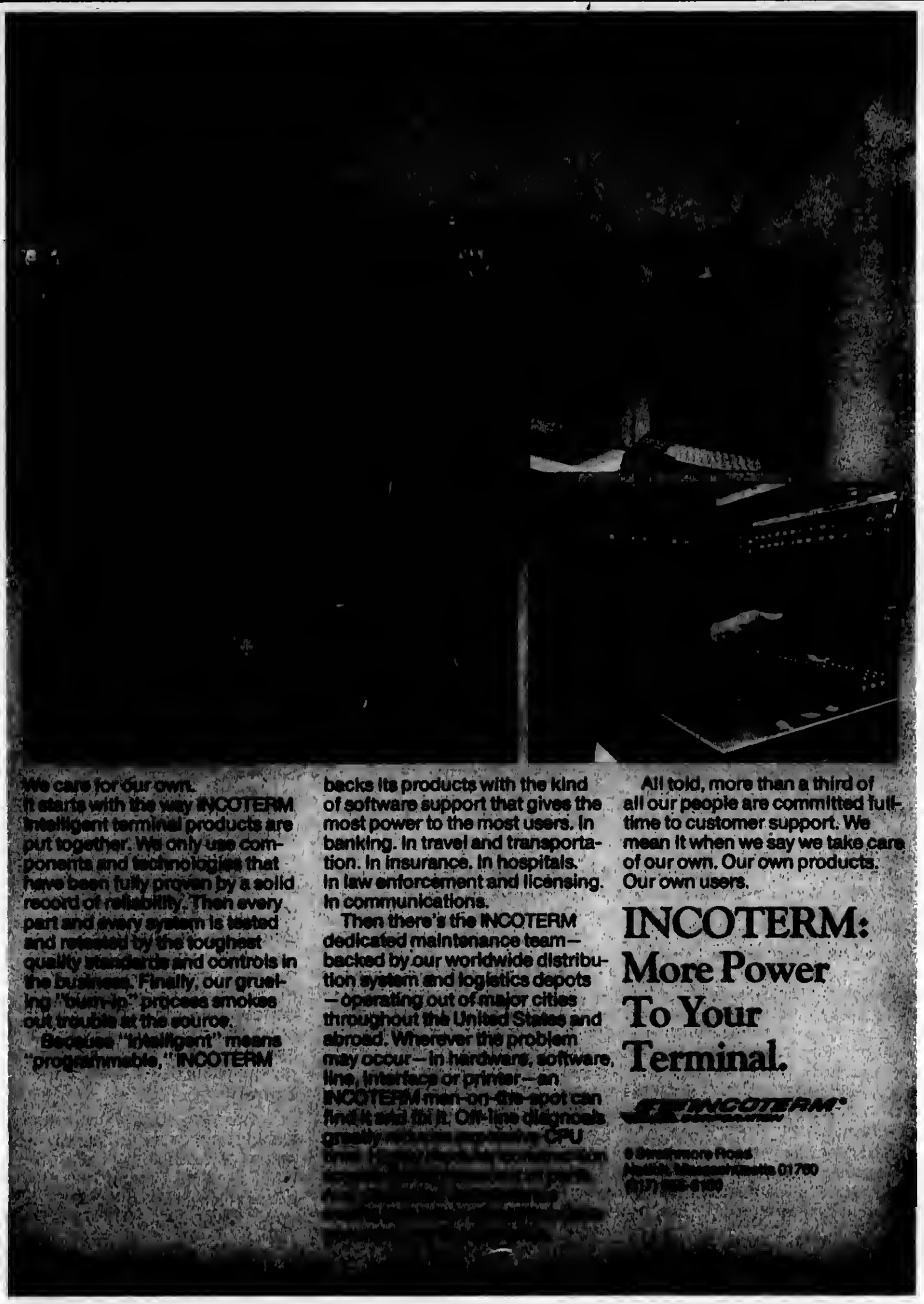
Eric A. Weiss is manager of planning and administration at Sun Services Corp. in St. Davids, Pa. This article was presented in a speech at Info 75 in New York City recently.

Device From Recortec Lets User Copy Tapes in Library

SUNNYVALE, Calif. – The Recortec computer tape copier (CTC) is an off-line device designed to allow the user to duplicate tapes within the tape library.

Tape library staff can also use the device to write tape headers, verify archival files, evaluate scratch tapes, verify incoming data tapes and clean and evaluate new tapes, the vendor said.

The CTC costs $2,500 from the firm at 777 Palomar Ave., 94086.





Because all double-density disk packs conform to certain industry standards, you might think they're all equal. They aren't. The important difference is the extent to which a manufacturer is willing to go in order to *exceed* industry standards. Because there may be times when your disk pack will have to survive excessive head loading, temperature variations, extended use, and other unexpected trials, we make a pack that will go the extra distance for you. Let's look at a few superior points of the BASF 1246 double-density pack.

The binder that won't quit

As you probably know, magnetic coating doesn't stick to the aluminum disk all by itself. We use a special binding agent to produce an incredibly strong bond. The disk is sealed to prevent oxidation, so you can be sure that the coating won't peel or flake off.

Our own coating process

At this high level of packing density, it is even more important to monitor the thickness of coating deposited on the disk. The problem is compounded by the necessity for progressively varying the coating thickness from the outside toward the inside of the disk, because packing density is greater as the circumference decreases. In addition, unlike conventional disk packs, double-density disks must be magnetically oriented, which calls for even more sophisticated technology. For these reasons, we've discarded conventional coating methods in favor of an exclusive process using our own BASF-designed equipment.

A polished performance

Following the coating operation, we use our own exclusive polishing process to achieve optimum surface regularity. Here again, we're dealing with a double-density medium in which the heads fly much closer to the disk surface than in conventional disk packs. With our new polishing process, we've been able to achieve a surface measurably smoother than the industry norm . . . so flat that the possibility of a head crash being caused by uneven disks is completely eliminated. We might mention here that the coating and binder formulation, combined with coating and polishing techniques, all are important factors in achieving surface hardness, which is the ability of the coated surface to survive excessive or extended head loading.

Achieving balance

Like any rapidly rotating object, a disk pack will behave strangely if not perfectly balanced. In our precision balancing operation, any weighting required is screwed into place, which eliminates the potential for shifting inherent in a conventional adhesive weighting system.

And to make sure . . .

We test our 1246 disk packs to standards much tighter than those of the leading equipment supplier. If anything unpleasant should happen, we'd much prefer it happen here than on your drive. As a regular procedure, we do scratch tests to check coating thickness, impact tests to determine head crash resistance, detergent tests to check resistance to wear and temperature variations, and drop tests to make sure balance and alignment don't shift during shipment. We test to make sure our 1246 disk packs are error-free.

Finally

Our 1246 costs no more than other double-density disk packs. You're already paying for BASF quality . . . you might as well have it. For more information on the 1246 or other BASF disk packs or cartridges, write to BASF Systems, Crosby Drive, Bedford, MA 01730 . . . or call our nearest regional office: in Los Angeles, (213) 386-7023; in Chicago, (312) 343-6618; and in Clifton, NJ, (201) 473-8424.

You're already paying for BASF quality, you might as well have it.



Inforex Tabletop Card Reader Expands 1300 Line Capabilities

BURLINGTON, Mass. – Inforex has added a tebletop card reader to expand the input capabilities of its Series 1300 key-to-disk systems.

The Model 2510 reads 80-column punched cards ef a speed of 300 card/min. Its applications include:

- Direct input from card to processing equipment.
- Direct card-to-printer transfer, which facilitates unit record listing, editing and reformatting tasks.
- Direct card-to-disk data transfer, with reformatting of previously edited data.
- Direct card-to-communications transfer, which permits users to move data quickly to an on-line transmission mode.
- Paging and searching for single or multiple records stored in a card-only format, wifhout the need for conversion to disk or tape medium.

The Model 2510 has a read speed of 300 card/min and a hopper capacity of 500 cards.

The card reader is transparent to Series 1300 operafing systems, Inforex said, so users require no modification of existing control software. The Model 2510 is installable and usable within an hour, with just a single card adapter end cable interconnection, the firm stafed.

Card Reeder Activity

All activities using the cerd reader are handled by Series 1300 systems software as if they were standard Inforex tape commands. Thus, eppropriate sfatus files, job file records and data transfers are automatically created and executed.

The card reader controls include a power switch, a reset switch and a halt switch. In addition, a "card reader busy" status light indicates conditions of hopper empty, stacker full, power off, card jam and reader check.

Purchase price per unit is $4,250, or $136/mo on a three-year lease, not including maintenance. The card reader adapter unit sells for $1,500 or leases for $34/mo over a three-year term.

Deliveries will begin in the fourth quarter of the year.

Inforex is at 21 North Ave., 01803.

Instrument Society Sponsoring Clinic On Camac Standard

PITTSBURGH, Pa. – A clinic on the Camac Standard Modular Instrumentation and Digital Interface System will be held in Milwaukee on Monday, Oct. 6, during the annual Instrument Society of America Industry-Oriented Conference and Exhibit. The clinic will begin af 2:30 p.m. in the Clipper Room of the Milwaukee Downfowner Motor Inn.

Tutorial Overview

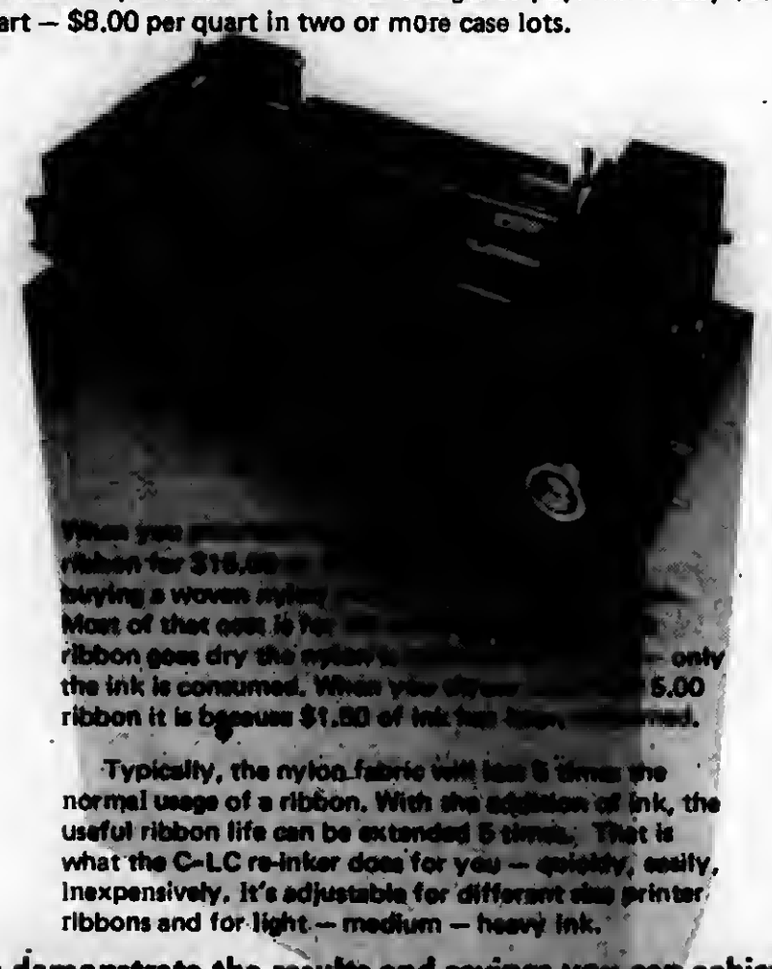
Camac is a standard of the International Elecfrotechnical Commission (IEC publication 516) with no proprietary aspects or licensing requirements. The clinic will include a tutorial overview. Software support as well as hardware standards will be discussed. Operating equipment will be on hand.

For additional information contacf Instrument Society of America, 400 Stanwix St., 15222.

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System Development Methodology

by **G.F. HICE, W.S. TURNER III** and **L.F. CASHWELL**

1974 IX + 370 pages US $ 31.25

The System Development Methodology is a comprehensive guideline for the planning and control of data processing systems from their concepfion fo disposal. The book provides an extensive number of checklists for all stages of system development and implemenfation. Special feafures include emphasis on the need for user involvement and the designing of systems for people insfead of for machines. The succesful application of the SDM by several firms over fhe past 3 years has led to the publicafion of fhis volume, and should therefore be especially useful for management, project managers, users, analysts and programmers.

Data Base Management Systems

edifed by **D.A. JARDINE**

1974 x + 279 pages US $ 26.95

The first SHARE conference devoted to the architecture and implications of large-scale data management systems was held in Montreal. Users, implementors and workers in this important area of computing, gathered together to discuss their mutual problems. Sixteen invited papers, two panel discussions and a section on responses from hardware and software vendors comprise these proceedings. The book first examines user-experience with IBM's IMS's, UNIVAC's DMS1100. CINCOM's TOTAL, HONEYWELL's IDS and XDS DMS and formulates user-requirements for future data base management systems. Data independence and implications of this on data structures, programming languages and system performance are some of the technical aspecfs which are analysed. Problems relating to the management of data base systems and the impact of such systems upon the enterprise are also brought into focus.

Data Base Management

Proceedings of the IFIP Working Conference on Data Base Management, Cargèse, Corsica, France, 1-5 April, 1974.

edited by **J.W. KLIMBIE** and **K.L. KOFFEMAN**

1974 x + 423 pages US $ 29.95

Papers presenfed at the meeting and summaries of fhe discussions ere contained in fhis book. Particularly outstanding features are: a discussion on the equivalence of the DBTG and relational approach; several differenf views of the data modelling problem; several theoretical treatments of implementation problems (data equivalence, access path selection, data base editions, concurrency, integrity, etc.) some articles on existing DBTG implementations.
A state of the art report, this book will be of incalculable value to researchers in the data base management area and to those people implementating data bases in real life sifuations (e.g. data administrators).

Human Choice and Computers

Proceedings of fhe IFIP Conference on Human Choice and Computers, Vienna, April 1-5, 1974

edited by **E. MUMFORD** and **H. SACKMAN**

1975 about 350 pages US $ 35.50

The increasing use of compufers in every sphere of human activity calls for a greater awareness of fhe role of computers in society.
At the IFIP Conference, computer technologisfs, trade unionists and social scientists discussed a variety of human problems: how fo use compufers and design systems for the collection and application of informafion which will give more, rether than less satisfaction to employees; how to improve democratic processes in management and prevent the concentrafion of excessive power in the hands of managers by developing information systems that are nof solely management-orienteted; fhe dissemination of information by governments and questions of privacy.

Data Base Description
An In-Depth Technical Eveluetion of Codasyl DDL

Proceedings of fhe IFIP TC-2 Special Working Conference, Wepiòn, Belgium, 13-17 January, 1975

edited by **B.C.M. DOUQUE** and **G.M. NIJSSEN**

1975 VIII + 382 pages US $ 31.75

The DDL (Data Description Lenguage), considered by many as fhe basis for standard data description in industry, was the main fheme of discussion at the conference attended by some 60 invited participants from 12 different counfries.
Implemenfors, users and lenguage designers including members of CODASYL committees jointly analyzed fhe DDL in order to preserve its strong poinfs, and if necessary, propose improvemenfs for weak points. Several papers describe improvements for the DDL. with summaries of discussions given after the relevant papers. Panel discussions are summarised af fhe end of the proceedings, the major resulf of these being fhe presentation of 10 recommendations to the CODASYL DDL Committee.

Economics of Informatics

edited by **A.B. FRIELINK**

1975 480 pages US $ 41.75

Three major themes are dealt with in these symposium proceedings:
1. The methodology of the **efficiency** of information systems.
2. The methodology of **effectiveness** of information systems.
3. The development of National Policies and Plans for Informatics.

These aspects are presented at the macro-level, by discussion of National Policies and Plans, and at the micro-level where the concepts of efficiency and effectiveness of informatics are dealt with.
The 45 papers contributed by experts in various economic fields emphasized the methodology of assessing the value of computer use and thaf of promoting, or at least monitoring, the rational application of computers.

Command Languages

Proceedings of the IFIP Working Conference on Command Languages, Lund, Sweden, July 29 - August 2, 1974.

edited by **C. UNGER**

1975 VII + 402 pages. US $ 29.95

This IFIP working conference brought together users and designers of operating systems with the purpose of establishing a common base for further research into command languages and their design considerations. Twenty five papers delivered at the conference cover: functions and facilities analysis, the relationship of command languages; formal descriptions of operating systems from the users' point of view; portability and machine independence; and network command languages.

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Mini, Terminals, Software Wed In Raytheon Satellite System

NORWOOD, Mass. – A computing system from Raytheon Data Systems can be adapted with a few keystrokes to perform six of the most common processing tasks in remote offices and departments served by a distributed information network, the firm said.

Raytheon said its PTS-1200 system combines conventional minicomputer, terminal and peripheral hardware with a software system that allows local offices of large organizations to perform:

- Source data entry and preprocessing, including editing and validating of most data.
- File and record maintenance, including creating, accessing, manipulating and updating locally stored data.
- Unattended two-way communications, either in point-to-point or multipoint networks.
- Stand-alone batch processing at a level comparable to that offered by small business computers.
- Report printing to enable branch offices to quickly produce a variety of reports.
- Terminal emulation that is "transparent" to the user.

The basic PTS-1200 hardware consists of a minicomputer with a one μsec cycle time, programmable main memory expandable up to 128K bytes, up to eight disk storage devices with a total capacity of 20M bytes of information, up to 24 CRT terminals and optional peripheral equipment that includes serial and line printers and a card reader.

Because of its applications development facilities, the software system makes flexible branch office computing economical and practical, the firm said.

The "foundation package" can be considered the baseline programming capability. It consists of a series of standard routines with which users can perform basic data entry, file generation and format creation with simple keyboard commands.

Each PTS-1200 system has its foundation package built in. Operators and programmers can actually be building files before the application programs are written, the firm said.

The ease and speed of initial start-up provided by the foundation package is amplified by the macro statements of the Macrol language, Raytheon said.

A list of 110 statements, easier to use than most high-level languages and developed specifically for this display-oriented system, enables applications programmers to develop jobs quickly, the firm added.

The macros are supported by a library of programming and debugging aids that enable some programs to be written, tested and be put into operation faster and more concisely than equivalent Cobol programs, Raytheon claimed. In addition, a library of utilities is included with the Macrol language.

Disk Operating System

The third major feature, the disk operating system, handles multitasking and multiprogramming. Programs are called from the disk by name and are immediately available to accept operator input, the firm said.

All of the systems and applications programs are disk-resident, requiring no card, cassette or tape loading. Nor does the system depend, in any way, on a mainframe for the compiling and validating of programs. The software is completely stand-alone, the firm said.

Among the direct benefits of the PTS-1200 system, Raytheon said, are reduced communications costs for transmission between the system and a host computer, reduced CPU usage and size, reduced forms costs and availability of information on a real-time basis because of the single common data base.

Communications are handled through binary synchronous on Ebcdic formats at up to 9,600 bit/sec.

Eight-Station System

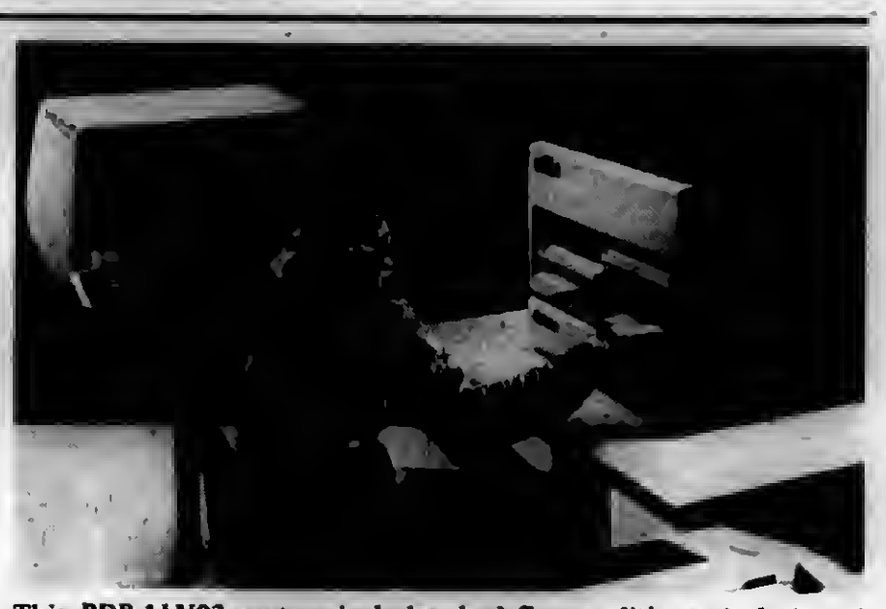
A typical eight-station system with 960-character displays, a 64K-byte processor, one 165 char./sec serial printer and 5M bytes of disk storage can be leased for $1,997/mo on a one-year contract or $1,598/mo on a three-year contract or may be purchased for $55,550. Maintenance and software are included in the lease prices. The firm is on Route 1, 02062.

Standards Anyone?

WASHINGTON, D.C. – The Minicomputer Interface Standards Task Group of the American National Standards Institute (Ansi) Committee X3T9 is completing the definition of the requirements for standard interfaces between minicomputers, device controllers and peripheral devices.

Specifications of existing interfaces are being collected and analyzed to determine their similarities and differences as a first step to the development of standards in this area.

The next meeting of this group will be in Denver at the end of September. Further information is available from: Thomas J. Alshuk, The Fenn Manufacturing Co., Fenn Road, Newington, Conn. 06111.



This PDP-11V03 system includes dual floppy disks and choice of VT52 CRT or LA36 printer.

DEC OEM Group Releases Printer, Micro System

MARLBOROUGH, Mass. – Digital Equipment Corp. has unveiled a 180 char./sec matrix printer and a microcomputer with an interactive, terminal-based, real-time operating system.

The LA180 Decprinter I has a full 96 character Ascii set with upper- and lower-case symbols and a 132-column print capability. The printer can handle forms of varying widths (from 3 in. to 14-7/8 in.) and has a paper-out-switch, top-of-form, self-test and backspacing capabilities.

The LA180 employs parallel interfacing and can be located up to 100 feet away from a central processing unit, the firm said.

Priced at $1,975 in units of 100, the LA180 can handle multiple forms of up to six parts. A rotary switch top-of-forms control permits the user to select any of 11 common forms lengths, the firm said.

Volume deliveries of the LA180 Decprinter I are scheduled to begin early next year.

Employs Tractors

The paper-feed system employs tractors with four-pin engagement. A fine vernier knob is provided for paper positioning. A servo system is used to transport the head along the machine's horizontal axis; carriage return has a duration of approximately 300 msec.

The PDP-11V03, a low-end real-time system, is built around DEC's recently introduced LSI microcomputer which uses the 400+ instruction set of the PDP-11/40. The standard PDP-11V03 employs dual floppy disk drives as a mass storage device, offers user's a choice of either an LA36 keyboard terminal printer or a VT52 Decscope video terminal as an input/output communication device and comes with an RT11 real-time operating system.

Users can add Fortran IV or Basic for higher level language capabilities, the firm said.

RT-11 Operating System

Operating software for the 11V03 is provided through the RT-11 operating system. RT-11 is a disk-based system that can be used to develop and operate user programs written in Fortran IV, Basic or machine language. RT-11 also includes program modules for software debugging, editing, file maintenance, library access and utility program operations, the firm said.

The system's mass storage unit is a dual floppy-disk drive, the RXV11, and has a total storage capacity exceeding .5M bytes. Its average access time is 483 μsec. Data is transferred between the disk and the microcomputer over bidirectional lines at a rate of 10,000 bit/sec.

Complete system selling price is $9,950 and will be deliverable beginning in January.

"The physical size and low cost of these microcomputers belies their actual computational power," a DEC spokesman said.

"With this system, for instance, a user of remote terminals can open, modify or close files stored on the disk system through communication with the host processor. At the host processor, both nonreal-time functions – operation of the line printer and terminal operations, for instance – are performed in the background of the RT-11 foreground/background monitor, while real-time tasks such as communication with the remote system and remote data acquisition are performed," he added.

Thinking Small Saves Chicago in Program Cost

CHICAGO – When it comes to financial applications, dealing with the city of Chicago's well-established, giant computer network can sometimes be too much of a good thing, as the Metropolitan Sanitary District (MSD) of greater Chicago found out recently.

"In fact, even though the city's existing computer system had more than enough capacity to service us, it would have cost us at least 50% more to convert the city's financial programs and link into their network than it would to buy a stand-alone minicomputer," DP Manager Walter F. Sobek said.

Key to the decision in favor of a separate, but expandable, business-oriented minicomputer system was A.G. Sciacqua's insistence on developing an on-line, interactive system to handle financial data such as the encumbrance and disbursement of all budgeted funds, user inquiries, payment of vendors and summary reports. Sciacqua is clerk of the district and also the head of the Finance Department.

Nine publicly elected trustees overseeing the district's anticipated budget of about $2 billion over the next 10 years opted for a Basic/Four Corp. minicomputer "primarily because it was the least expensive and most applicable system to handle our problem," the DP manager said.

Obvious Solution

"After the manufacturer of the accounting machines we had been using for decades for appropriation accounting told us parts would no longer be available, the obvious solution appeared to be a terminal linkup into the city's existing, massive financial computer system. But a consultant's estimate to redesign its very large computer network to handle our specific accounting needs came to almost $100,000 and we would have to provide our own programming in addition," Sobek said.

Interestingly, replacement of current bookkeeping machines could have been achieved with modern accounting machines hard-wired to perform the posting functions carried out by the government agency.

"Advances in accounting equipment were evident, but these devices simply did not fulfill the basic requirements of an on-line input and inquiry system, since they are still primarily key-driven, electromechanical devices," Sobek said.

"We then looked to several minicomputer manufacturers which would be willing to perform the turnkey job of providing hardware and software to our specifications for on-line appropriation accounting."

As Advertised

Representatives of the Metropolitan Sanitary District fixed on Basic/Four as a leading possible supplier and visited several area installations without a representative from the minicomputer business system manufacturer present.

"We found the systems used elsewhere were performing 'as advertised.' This step of visiting other users before purchasing is a must in my estimation, along with a Dun & Bradstreet report on the manu-

(Continued on Page 38)

The Hewlett-Packard 3000 is a minicomputer?

"The 3000 a minicomputer? I think calling the 3000 a mini is an abomination!"

When we asked Mr. Thomas Harbron, Director of the Computing Center, Anderson College, Anderson, Indiana, what he thought about the HP 3000, he had some very interesting things to say:

"We're using the 3000 for administrative processing, academic work and some commercial work. We have 27 terminals and we selected the 3000 because we wanted a system that would provide us with remote access and would do general purpose types of things from the terminals. The 3000 allows us to do many different things at different terminals. In fact, it does everything we expected it to do and was the only machine we could find in its price class that would. I'd recommend the 3000 to others. It's a powerful and versatile machine. And it's cost effective as well. It's half the price of anything that comes close to it."

"I don't think that Hewlett-Packard ought to call the 3000 a minicomputer. It is a complete medium-sized system."

That's what the EDP center manager of an aircraft manufacturer said about the 3000. He also had this to say:

"One primary reason we bought the 3000 was to collect and analyze radar development data. The problem is that we have to collect data fast enough, pipe it to a computer, analyze it, and then make the necessary instrument adjustments. HP's 3000CX was the answer. We also bought it for its interactive capability. Very significantly, in our acoustics department we had to have the ability to turn around data analysis fast. The 3000 has been a real cost saving computer for us. For the last two years I was the entire staff for the 3000. Not a great deal of detailed knowledge of the system is necessary. Technicians can use it without much training. I'm very much sold on the 3000. And it's definitely a complete system—not a minicomputer."

"It allowed us to run eight times the volume at a third the cost. No minicomputer could do that!"

The above statement was made by the corporate banking division EDP manager of a major California bank. He also said:

"We've had the 3000 for over nine months. A year ago we were on a time-sharing system and the cost became prohibitive. We contacted six different companies to look over and bid on a proposal that defined our needs. HP was the only one that could handle our total application of management information for the Corporate Banking Division. The 3000 is not just a mini—it's much more. We're constantly amazing people here with what we can do. It's not hard to operate, not hard to cope with. But our favorite topic is that we're paying less than one third of what we were paying and running four times the volume. And this year, we'll double our volume again. That's eight times greater and less than one third the cost.

That's really productivity!"

"We found the only thing mini about the 3000 was its price."

When we asked the EDP center manager of another major manufacturing company about the 3000, that was what he had to say. He also had this to say:

"Our computer needs include both scientific and commercial applications. We were phasing out our teleprocessing terminal and our Environmental Monitoring Division's computer. So we started looking. We spent several months studying computer systems, and rated them on speed, versatility and ease of operation. The result of our study showed that the HP 3000 provided these requirements and had the best cost/performance ratio. We didn't fully realize the potential of the 3000 until we started programming it. We have experienced a significant cost savings in the seven months we've had the 3000 and we expect a greater savings in the months ahead. We really like the interactive CRT for programming and data input. Being a multi-programming system we can have many users on at the same time. The power and speed of the 3000 is equal to a large machine. It's no mini. Calling it the Mini DataCenter is more accurate. I'd definitely recommend the 3000 to other potential users. In fact, we already have. We feel they would be money ahead."

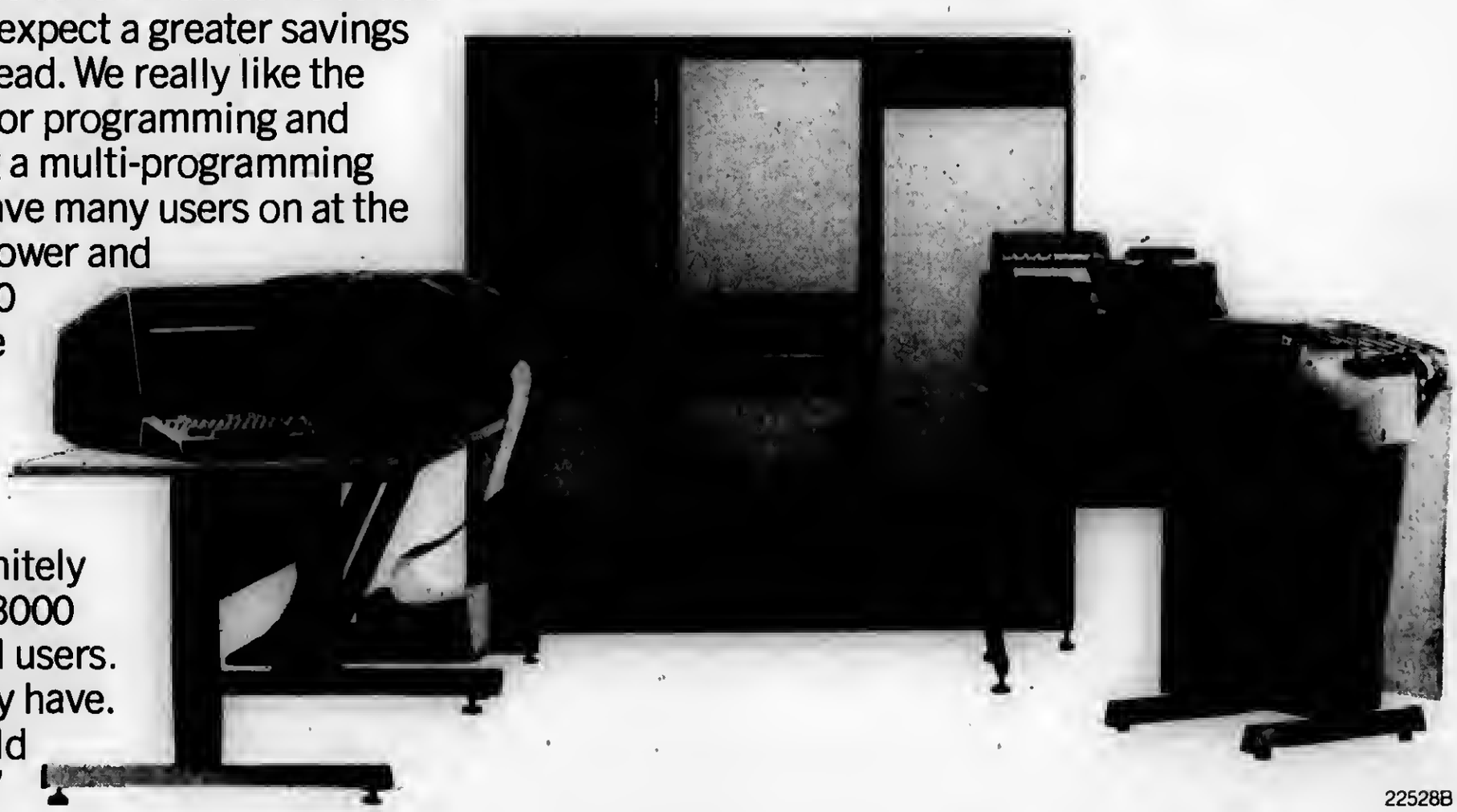
We're glad these and other users of the HP 3000CX set us straight. We called it a minicomputer because its state-of-the-art technology lets us sell it for a minicomputer price. From now on we'll call it a Mini DataCenter.

We want you to get the whole story. Write us for your copy of our HP 3000CX Mini DataCenter booklet. We know you'll find it interesting, informative, and maybe a bit surprising.

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Hardware Savings Lost in Software Development

By Edith Holmes
Of the CW Staff

NEW YORK – A user may conserve hardware funds by buying a minicomputer, then lose all his savings in software development, Eric Frey, president of Frey Associates of Windham, N.H., told an Info 75 audience here recently.

For this reason, the definition of software costs becomes all important in the buyer's decision to go with a mini, he told an introductory session on minicomputers in business.

"Software costs go up exponentially when compared with the order of complexity of the application," Frey noted, adding that minis generally are best suited to a dedicated apolication or groups of applications.

"A mini manufacturer won't be able to provide the extensive software development – say on the order of $2 million – that IBM will put into a large-scale machine," Frey stated. Yet the software costs and the development and implementation demands of a mini-based system are the same as those of a large mainframe.

In some areas, he suggested, a mini may even require more in the way of planning. An on-line, distributed mini system, for example, necessitates a certain amount of education. "Such processing is very different from the centralized batch operation that the staff of a large device is likely to be used to," Frey said.

Finding Software

Users in search of software for their minicomputers and not interested in writing it themselves can go to turnkey systems houses or to software houses or to consultants. In the case of the turnkey vendor, only licensing rights will be purchased; "you will not own such software," Frey said.

"Software houses and consultants will follow usual business practices and, if you ask to own the programs, that can be written into the contract."

"At present, there are no significant large-sized software houses selling packaged mini software, except for the few that design operating systems for minicomputers," he added.

When looking for hardware, "knowing what you want in the way of applications allows you to make up a list of target vendors," Frey noted. "And, in my opinion, the big mini makers have more to offer in this realm than the large mainframe manufacturers.

"Once IBM and the seven dwarfs seemed to be taking an active interest in this market. The first minis to dominate the field were the Honeywell 316 and 516 machines," he commented. "But, by 1966, Honeywell was second to Digital Equipment Corp., and now its sales rank about 13th."

The big three in minis now are DEC; Data General Corp. and Hewlett-Packard, he said, adding that no mini manufacturer has yet developed a wide range of business applications and machines.

"Datapoint, not one of the companies you first think of when minis are mentioned, is the only one that has a pretty good business machine hardware and softwarewise." He indicated DEC had the hardware potential, but little commercial software suitable to business applications.

When considering turnkey systems, Frey urged his audience to look at price and performance and to make certain the vendor takes an interest in learning about the business environment in which the system will be working.

Finally, Frey cautioned would-be mini owners to evaluate the vendor for maintenance capability and potential for application and system growth.

Thinking Small Saves Chicago 50% of Cost Of Financial Program

(Continued from Page 35)

facturer's finances," Sobek said.

Satisfied from this standpoint, a programmer analyst was designated to create specifications for the system, in conjunction with personnel from the Treasurer's Office, the Accounting Division and the Management Control Office.

"The minicomputer systems vendor was obligated to MSD to deliver the hardware and programming for the agreed-upon price," Sobek emphasized.

The software was contracted to an outside vendor. While system testing was in progress, the Chicago MSD sent two programmers to a Basic/Four four-day training course.

The ability to increase usage of the on-line minicomputer system proved of major importance to the district, a move which MSD estimated would have been much more complex with either a tie into a larger computer or the use of accounting machines. In fact, MSD has programmed two entirely new applications since acceptance of the system and added another CRT terminal, an additional disk drive and additional memory.

"System maintenance is contracted to a division of the minicomputer's parent company at approximately $300/mo and downtime is practically nonexistent," Sobek said.

The system is composed of a CPU, two disk drives, three CRT terminals, a printer and a magnetic tape drive. The magnetic tape is the data exchange media to the MSD's in-house IBM 360/40 computer.

Device Added by Datapoint Prints at 600 Line/Min

SAN ANTONIO, Texas – A 600 line/min printer is available for Datapoint intelligent terminals and small business computers.

The printer uses a 64-character font on a 132-column format on up to six-part, carbon-interleaved, multipart forms.

The Model 9260 uses the drum method of printing and features a swing-away gate for paper loading. A clutchless paper feed and voice-coil print hammer positioning make the printer highly reliable, Datapoint said. Liberal use of acoustic material keeps noise to a minimum, the firm said.

The 9260 leases for $612 on a two-year basis including maintenance within a standard maintenance area.

The firm is at 9725 Datapoint Drive, 78284.

SILENT 700
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"Silent 700"
programmable data terminals:

A price you can afford.
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"Silent 700*" Model 742 programmable data terminals offer a lot more than mere intelligence for business management systems.

They give you a complete terminal package in locations where most business information is generated and used . . . such as remote offices, warehouses, stores or hospitals.

A quiet, self-contained thermal printer gives you a retainable audit trail of transactions for easy reference, routing and filing.

The simple TICOL language lets you generate your own user programs on the terminal itself, with no separate equipment or central computer support required.

And the same terminal package holds all the communications features and options you need to move data to and from your computer or other terminals.



Versatile "Silent 700" programmable data terminal offers easy operation and powerful options for many business management systems.

Cost-effective performance

Standard in each "Silent 700" programmable data terminal is the microprocessor and memory capacity to handle most user applications.

For applications requiring increased capacity, additional memory with a more powerful TICOL language can be added as an option in the same terminal package.

Dual magnetic tape cassettes let you store your programs and data conveniently, for later transmission to your computer.

And combined with these powerful performance features are quiet 30-characters-per-second printing speeds and communications features that help reduce over-all system costs.

Improving man's effectiveness through electronics

Applicon Combines Line, Photo Plotting On One Machine

BURLINGTON, Mass. – A flatbed plotter from Applicon, Inc. offers both line and photo plotting capabillties in a single unit.

Known as the AP53 graphic plotter, the machine has interchangeable heads and removable panels that adapt the equipment for either line or photo plotting in less than three minutes, the firm said.

Average speed during printing is 10 in./sec. At all other times – when the head moves to a new position, for example, or when the unit is used for line plotting – speed ranges up to 40 in./sec.

The machine is capable of outputting 33-in. by 45-in. drawings on either conventional or photosensitive media.

A magnetically controlled frictionless motor drive eliminates gears, servos, cables, ball and lead screws and the tolerance loss associated with conventional plotters. The equipment operates with positioning accuracy of 1 mil/ft/axis while maintaining 5 mil accuracy over the total active plotting area, the firm said.



Applicon AP53 Graphic Plotter

The plotter is priced at $70,000 when furnished with the Applicon Graphic System. It may also be used off-line with the addition of a separate controller.

Applicon is at 154 Middlesex Tnpk., 01803.

Mini Cuts System Costs 50% As Engineers' Workload Doubles

CORAPOLIS, Pa. – A compact computer has cut computer costs in half, while the workload has doubled for The Chester Engineers, Inc., an environmental engineering and planning company headquartered here.

The system is used not only for on-line problem solving in a number of disciplines such as chemical, electrical and structural engineering but also for automated preparation of specifications, operating manuals and other published materials.

The Chester Engineers offers technical services pertaining to sanitary engineering, air-quality control, solid-waste management and the management of industrial and municipal wastewater.

Before leasing a Hewlett-Packard (HP) 3000, The Chester Engincers subscribed to a time-sharing service. The HP 3000 has cut The Chester Engineers' monthly computing costs by about 50%, while DP volume has approximately doubled, according to Paula Wilson, the systems analyst who supervises computer services for the company.

Wilson said two projects have depended heavily on the HP system:

- The company has developed computer programs for analyzing rainfall and water-flow data from separate and combined sewer systems. The data are collected by automatic strip-chart recorders at treatment plants and at overflow points (where untreated wastes are discharged to recciving waters).

This information is digitized, converted to flow volumes (by reference to rating curves) and used in generating hydrographic plots that relate hydrological conditions within the sewer system to rainfall and soil moisture. These programs, in conjunction with other statistical software, provide rapid analysis of large volumes of hydrological data for the dcsigning of ovcrflow facilities.

- Now under development is a computer mapping system for analyzing both the magnitudc and distribution of numerous environmental factors that are related to the discharge of pollutants.

Thcse include soil typcs, geology, land-use patterns and population densities. The system would accept both alphanumeric and cartographic inputs, and it would be able to take data from maps drawn to different scales, styles and cartographic conventions.

As output, the mapping system would be able to present plots showing, for example, all the areas within a study region having a given population density. Such plots would be used in urban planning and in studics dealing with land-use policies.

Thc Chester Engineers' computing system includes a tape drive, two 5M-byte disk drives, a line printer, a Calcomp plotter, three CRT terminals, two hard-copy terminals and a Scriptographic tablet for entering graphical data onto graphical displays.

In choosing a computer for the system, the company considered computers from 15 different suppliers, Wilson said.

Only two of them could provide true time-sharing and multiple-languages; all of the others were limited to Basic.

35 Makers Exhibiting At California Show

LOS ALTOS, Calif. – The California Computer Show will be hcld tomorrow, Sept. 25, in Los Angeles at the International Hotel. Show hours will be from 1 p.m. to 7 p.m.

The California Computer Show is an invitational show that will fcature 35 selected manufacturers of computer products and provides OEMs and end users the opportunity to discuss their requirements with factory personnel.

The show management can be reached at 95 Main St., 94022.

Arithmetic Processor Works With Harris Corp. Slash 5

COCONUT CREEK, Fla. – Data Engineering, Inc. has a Scientific Arithmetic Processor (SAP) for the Harris Corp. Slash 5 central processor.

The unit upgrades the Slash 5 to exceed 80% of the Slash 4 performance with SAU.

The SAP is priced at $9,500. The unit is also available for the Slash 3 ccntral processor for $12,500.

The firm is at 4070 N.W. 5th St., 33066.

Systems network adaptability

If your business system involves tying your Model 742 terminals together in a complete communications network, TI offers the Model 700 TPS* Terminal Polling System.

Designed around the TI Model 960 Series minicomputer, the TPS automatically calls remote "Silent 700" data terminals, collects data stored on the magnetic tape cassettes, and logs the data on magnetic tape in a format readable by a host computer.

This scheme gives users a complete, cost-effective data capture network for distributive data processing and communications.



International Harvester dealers throughout the country use "Silent 700" programmable data terminals for quick, economical management of inventory and accounting data.

International Harvester found more . . .

International Harvester, which recently selected a large quantity of these models for use by its dealers for remote data entry and local processing in Service Parts Inventory Management and Dealer Accounting Data Services, has this to say:

"The TI terminal answers International Harvester's needs — simplicity of operation, nationwide service and the capacity to fill our dealers' requirements at a moderate price."

International Harvester dealers throughout the country will benefit from reduced information transmission time, better control of warehouse parts inventory and smoother daily operation with continually up-to-date information.



Model 700 TPS Terminal Polling System links the TI 960 Series minicomputer with "Silent 700" terminals for a complete data network.

What's your application?

If you're interested in an affordable solution for your distributive data processing and business management systems needs, contact the TI problem-solvers at the nearest office listed below. Or, write Texas Instruments Incorporated, P.O. Box 1444, M/S 784, Houston, Texas 77001. Or, call Terminal Marketing at (713) 494-5115, ext. 2126.

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TEXAS INSTRUMENTS
INCORPORATED

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THE INFORMATION SYSTEMS HANDBOOK



THE EXECUTIVE'S GUIDE TO PLANNING AND UTILIZING THE SYSTEM MOST EFFECTIVE FOR THE COMPANY'S NEEDS

Tha Information Systems Handbook is your guide to planning, aeiecting and utiiizing the information system most effectiva for your company. An effective system can save your company thousands of doiiars. A poorly planned and poorly managad information system can cost *your company hundrads of thousands of dollers!*

The past two decades have seen a remarkabla growth in the importance of data processing systems in the management of corporationa. The increase in the complexity of equipmant and programs together with the concommitant increase in the compiexity of the organizations they serve confronts executivas with a bewiidering array of information syatems from which to choose. This handbook wiil heip you make the selection that wiii provide optimum aervice at the minimum investment of time and resources.

Each chapter was written by an authority in the field and, to further increase the authoritativeness of the entire work, each chapter was also raviawed by both businessmen and acadamicians. The forty chapters have been grouped into six sections which cluater related groups of issues and mirror the orgenization of the date processing department. The first two sections deal with the broad responsibiiities of the data processing executive aa a member of the top management team and as an administrator of a major function. The third aection deals specificaiiy with the probiem of manpower administration and deveiopment. The fourth section focuses on the methods end tools for evaluating the technical aiternatives facing the organization. The fifth and sixth aections deal respectively with the iasues relating to the development of new applications and managing the computer operations activity.

About the Editors





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DBMS Proving Popular

Recession Sparking Sale of Software, Vendors Agree

By Molly Upton
Of the CW Staff

NEW YORK – Software vendors, especially those selling data base management systems (DBMS), generally agree business has improved markedly over last year – and many credit the recession in part for the upswing.

"With the recession, people are looking to conserve money and they see tried-and-true packages as the way to go," according to Don Keith, project manager of financial applications for General Computer Services, Inc. of Huntsville, Ala.

"Business is up more than 100% over 1974" at General Computer Services, Keith said at Info '75 here recently.

General Computer Services started with banking applications and two years ago began selling to the commercial area.

Now the firm plans to enhance its utility routines developed for the payroll package and market them as well as a new product for personnel, he said.

Forrest F. Preece, marketing communications manager of MRI Systems Corp., said economic conditions have helped MRI's data base management business.

The number of inquiries the firm receives is up 50% over last year and MRI "is far ahead of business goals for the year," he said.

MRI plans to stay basically in the data base management field and is looking for "some innovations" in that area. It markets the System 2000 and TP 2000, a teleprocessing monitor.

Best Year Ever

Cincom Systems, Inc. is having its best year ever, according to Mark Friedman and Frank Marsella, marketing representatives.

Cincom's growth rate is between 150% and 160% over last year at this time, Friedman said.

He said much of the increase is because the public is becoming much more educated about DBMS and the firm has broadened the number of vendors' mainframes on which its DBMS, Total, runs.

Total now is available on Control Data Corp., NCR, Univac and Spectra machines and was announced for Varian gear. The firm is also developing a version for Burroughs machines, Marsella said.

The goal by 1977 is to have Total on the systems of all major hardware vendors, Friedman said. It is also planning a utility for Total as well as a data dictionary, Marsella added.

Its current new product, Entry Environ I, is for new telecommunications users.

Cincom has doubled the number of employees since 1974 and now has 300, with offices in Australia and Brazil and a representative in Japan, Friedman said.

Unlimited Demand

Cullinane's marketing manager, John Cooper, said the firm is doing 50% to 75% more business this year than last.

"I'd like to think the reason is we're working harder," he said, explaining he views the software market as unlimited demand with success determined by the people and time spent in generating interest.

Although he doesn't think Cullinane's customers have been affected by the recession, he said any pressure to scrutinize DP expenditures has been to Cullinane's advantage: "They don't go to IBM automatically."

Pansophic Systems, Inc. should do 150% more business than last year and is ahead in the first four months of its new fiscal year, which started in May, compared with last year, according to Lee Mulder, communications director.

Although the summer was slow, May and June more than compensated for the slowdown, he added. It looks as though Pansophic's new European subsidiary will place more installations in September than the parent firm here, he said.

Recently the firm released new versions of all its products, which are supplied without charge to the 92% of its customers who have maintenance agreements, he said.

Pansophic plans to stay in its current market area of IBM 360/25s and up and 370s and not expand into the mini market for the time being, he said.

Studies showed it is too expensive to adapt Easytrieve and Panvalet to minis because it is almost impossible to make a profit and sell at a minicomputer price, he said.

Pansophic's marketing thrust is to get corporate management involved in the DP center by showing how its Easytrieve would help them obtain reports.

The firm plans to be 100% of quota as of October and then through the end of the year, he said.

"We boom in recessions," Mulder observed, adding the two other growth spurts were in recession times.

Business Unchanged

Program Products, Inc. salesman Ron Singer said business is "very similar to last year."

This is a good sign, he added, because the firm's products are in the personnel retrieval area.

(Continued on Page 42)

Micros' Success Dependent on Software

By Molly Upton
Of the CW Staff

SAN FRANCISCO – The success of microcomputers in the marketplace will depend on getting software development tools that effectively shorten design cycles and reduce development costs, Gerry Madea of National Semiconductor Corp. told a session at the Western Electronic Show and Convention (Wescon) here last week.

Software technology appears to lag behind hardware technology, he told the session on microprocessor/microcomputer hardware and support systems.

"The test of the microcomputer manufacturers and customers alike will be how well each appreciates the 'software problem' and understands what tools are required to enable design engineers to effectively use this new generation of computer power," he said.

Solutions outlined during the session included improved translators, a block diagram language, distributed processing techniques and the integration of software and hardware development through in-circuit emulation.

Madea said "language design appears to be the first place to look for software improvements or breakthroughs."

Research must be done to discover languages "that parallel productive, creative thought processes in algorithm design," he said.

Coupling a language that provides "top-down" design flowing into code implementation with concepts of "stepwise refinement" and "modular decomposition," all early activities in the software development cycle, possibly could be automated, Madea said.

"Maybe future languages will supply the software designer with facilities to easily invent his own data structures and operations allowed on those data structures," he suggested.

Libraries of data structure and code generation specifications either machine-dependent or -independent, can be supplied, he said.

(Continued on Page 42)

CW At Wescon

Decision Data Test-Marketing System 4 for Small Businesses

By Patrick Ward
And Molly Upton
Of the CW Staff

HORSHAM, Pa. – Decision Data Computer Corp., supplier of small business system peripherals, is test marketing its own small business system – the System 4 – in the Philadelphia area.

The firm is not ready to support the system nationwide, according to Loren Schultz, Decision Data president. After the company has installed about 20 systems in the Philadelphia area, however, it may expand its marketing effort into the New York City region, he said.

Decision Data's move to broaden its product line followed a decline in OEM orders during the first half of this year.

The company already makes MOS memory for use on the IBM System/3 Model 10, and this will be incorporated into the new System 4.

The System 4's processor is being offered in both card and disk-oriented configurations. It uses the Intel 8080 microprocessor and is available in 32K, 49K or 65K Mosfet memory.

The price range is $500- to $1,600/mo, with purchase prices starting at $20,000.

(Continued on Page 42)

500 in the Pocket

SAN FRANCISCO – Digital Equipment Corp. already has 500 orders in its pocket for the Decprinter I, unveiled at Wescon here last week, according to George Abbott, product marketing manager.

DEC's entry in the line printer market is expected to be at least as successful as Decwriter I, of which 12,000 have been installed to date.

The printer will be adopted by the Business Systems Group first, and later will be offered on the PDP-8 and PDP-11.

Priced at $1,975 in quantities of 100, the Decprinter I offers a 7 by 7 matrix, upper and lower case and top-of-form command as standard features (see related story on page 35).

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Decision Data Testing System 4

(Continued from Page 41)

Like IBM's System/32, the Decision Data System 4 will offer industry application packages, concentrating on manufacturing, order entry/inventory and general accounting because "that's where the need is," Schultz said.

"Forty-eight percent of the users of the System/3 are in manufacturing and maybe 16% are in distribution," he noted.

Decision Data chose RPG-II as the programming language because "there are thousands of people out there who can program in RPG and can also use all the packages floating around," he added.

The company recently added Mosfet memory and 300- and 600 line/min printers to its primarily card-oriented peripherals line.

"The point is we had been providing all those supporting products and had everything but a processor. But there's nothing to processors today, so we developed one," Schultz said.

The System 4 is aimed at companies with up to 250 employees. "There are almost three and one half million companies" in this size range and "only 1% have a computer," he said.

Decision Data, with its 4,000 customers and 70 service centers, feels it has the market base and service capability to launch a small business system, Schultz said.

Financially, "this is a better buy market than our current product line, which is a lease market," he remarked. "We also feel these products have more growth potential than our current products."

Decision Data will handle maintenance for the System 4 itself, but plans to work with software houses to develop application systems, Schultz indicated.

As for its other end-user product lines, business is holding up, Schultz claimed.

"People are price-sensitive in a tight economy," he added.

Decision Data's memory, for example,



Loren Schultz

could offer as much as a 70% discount compared with an IBM core unit, he said.

The firm is aiming for a 50-50 split between OEM and end-user business. However, OEMs have been "holding off implementing major special programs," he said.

The firm sells to about 40 different OEM customers, including Burroughs, Honeywell and Digital Equipment Corp., Schultz added.

Recession Sparking Software Sales Rise

(Continued from Page 41)

Software AG has doubled its sales in North America in each of the last two years, according to Thomas R. Berrisford, manager of market development.

The firm is receiving three times as many inquiries now than it did at this time a year ago, he said. In the last year and a half, its staff has doubled and its advertising budget has tripled.

"There seem to be more and more study committees" set up by firms to evaluate DBMS, he said. "Users used to decide without evaluating, but now are considering alternatives," he added.

Although the firm had a slow start initially because Adabas, its DBMS, was not developed in the U.S., the product has gained sufficient acceptance to overcome that block, he said.

Software AG now has 15 field technical persons, each handling up to six or eight installations, he said.

The firm has no plans to expand outside of the data base market, he said, observing "it seems a majority of organizations have not made decisions yet on data bases."

Success of Micros Depends on Software

(Continued from Page 41)

Using the translator to optimize the trade-off between memory space and execution time would lessen the burden on the programmer, he indicated.

Block Diagram Language

Granino A. Korn of the Electrical Engineering Department at the University of Arizona outlined a block diagram language.

Such a language would "make it easy for applications-oriented nonprogrammers to generate efficient microcomputer programs without any need to learn Assembly language," he said.

The proposed programming system is "essentially independent of the type of microcomputer used and will also permit convenient and realistic interactive simulation of microcomputer program execution," he said.

Work is being done at the University of Arizona on two block programming systems: Microdare, which is developed from an Extended Basic system requiring no elaborate disk operating system, and Dare/Eleven, he said.

Under-Korn's scheme, a user specifies an analog computer-like block diagram whose block operators specify standard mathematical operations and input/output operations. These operations are implemented as subroutines in the read-only memory (ROM).

An interactive editor/translator program running on a small mini translates the specifications into an address table and loads it into the micro's memory, whether random-access memory (RAM), ROM or programmable read-only memory (Prom), he explained.

The address table specifies successive jumps to the correct standard subroutines in ROM and data fetching/storing operations in RAM, Korn added.

J.E. Bass of Rockwell International's Microelectronics Device Division said the use of distributed processing techniques with micros will reduce the software complexity and development times as well as ROM program requirements.

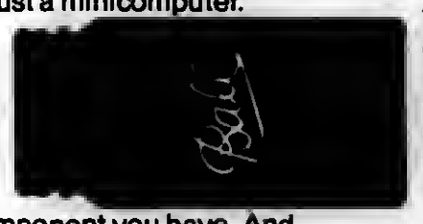
Redesigning micros for distributed processing can overcome the inherently lower performance of MOS/LSI compared with bipolar technology, he said.

By distributing the intelligence through the system chips, the CPU is involved only in controlling buffer transfers to and from intelligent peripheral controller chips instead of providing detailed control functions, Bass said.

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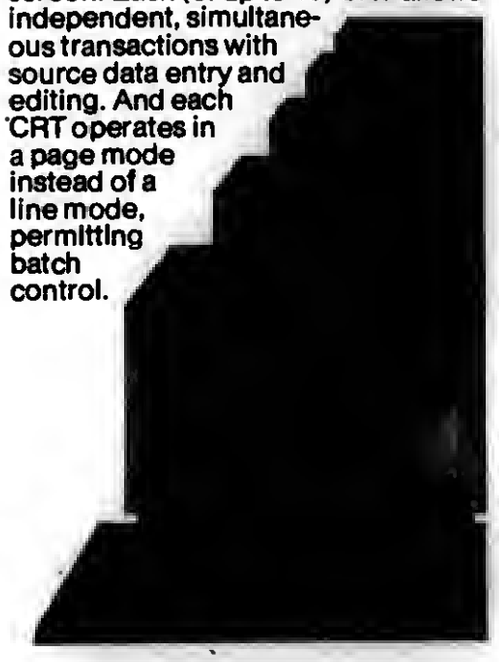
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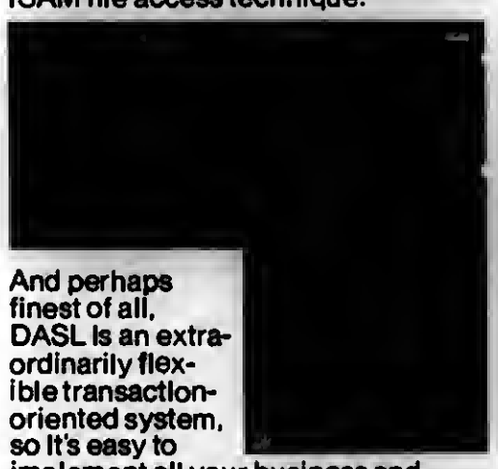
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Venture Capital Not Only Choice

Financing Alternatives Urged for Young Companies

By Molly Upton
Of the CW Staff

SAN FRANCISCO – During hard times, young companies should look to funding sources other than venture capital and bank loans, Christian Hoebich, president of Hoebich Venture Management told attendees at the Western Electronic Show and Convention (Wescon) here last week.

Young companies often "overlook or abuse practical sources of capital such as properly utilizing trade credit, tapping customer advances and borrowing money from their landlords," Hoebich said.

Because a growth company could represent a customer of increasing importance, it might be possible to extend a firm's credit to 60 days, he explained.

As the confidence of suppliers is gained by paying within this time, payments might be stretched to 70 or 80 days. However, he emphasized, creditors should be kept informed.

"Careful management of trade credit is one of the most inexpensive sources of capital since it does not cost any interest," he said. "However, be sure to periodically check and compare prices to prevent hidden carrying charges."

One should carefully examine tradeoffs, he advised: "It may behoove your company to purchase more subassemblies or even total assemblies so you can exploit more suppliers' credit than by merely buying components."

Risking Bad Impression

Another method is obtaining early payment or even advances from customers. If properly presented, this is a viable option for a young growth company and should be explored in detail, he said.

Hoebich acknowledged many young companies are reluctant to ask their customers for advances because they risk creating the impression the firm is a marginal operation.

A third method, popular in California, is to borrow funds coupled to a long-term lease with a real estate developer. Generally a company can raise $4 to $5 per square foot through this method; the term of the debt is equal to the term of the lease, he explained.

"As long as the developers can sell this property for a higher price based on the increased rent, this interesting alternative may become an increasingly popular method of financing a young company," he observed.

Commercial Finance Companies

Commercial finance companies offer a somewhat more flexible source of capital than banks, William F. Plein, president of Commonwealth Financial Corp., explained.

They emphasize collateral as a basis for a loan while banks emphasize net worth with only secondary consideration for collateral, he said.

Collateral lending can "grow with the needs of emerging companies when they are not most likely to be heavy on collateral and light on tangible net worth," he said.

The most flexible tool offered by commercial finance companies is the accounts receivable financing, whereby funds are made available at the time of shipment at a mutually agreed percentage of the net invoiced amount.

This method usually is done without notification to the customers. The best receivable portfolios are those where the risk is spread rather than concentrated in any one customer, he added.

As sales grow, more capital is available, he said.

A somewhat less flexible method is an inventory loan, which is secured by raw materials and finished products. Advances, usually less than on the accounts receivable, are formulated as a fixed percentage.

Usually these loans are made in connection with an accounts receivable loan, Plein said.

Term loans are somewhat unpopular with most lenders today and are usually made only to accounts receivable borrowers, he said.

Factoring is similar to accounts receivable but requires notification of customers since the commercial finance organization performs bookkeeping and collection services, he said.

The lender also does credit checking and guarantees its clients against credit losses. In this method, the commercial credit firm purchases the accounts receivables for a discount.

A firm can therefore eliminate its credit and accounts receivable departments, at least reducing the cost of the discount, Plein explained.

David G. Arscott of Citicorp Venture Capital, Ltd. (CVC) said the criteria desired by investors center on management, the product or service offered and the financial plan of the firm seeking money.

CW At Wescon

CVC invests in firms with "experienced entrepreneurial businessmen whose backgrounds aid the development of skills needed in company formation and expansion," he said.

Since younger companies usually depend on a limited number of products, the quality of that product and its market potential are especially important, he indicated.

A business plan should include a funding strategy for three to five years. "This plan could include bank and lease financing sources and should address the question of raising additional capital for expansion," Arscott said.

"The importance of planning credit cannot be overemphasized. Planning is the key to companies, regardless of size, but it is especially needed in new or young enterprises," he said.

In addition, a "disaster plan" developed by top management to deal with unexpected but possible contingencies is advisable, he said.

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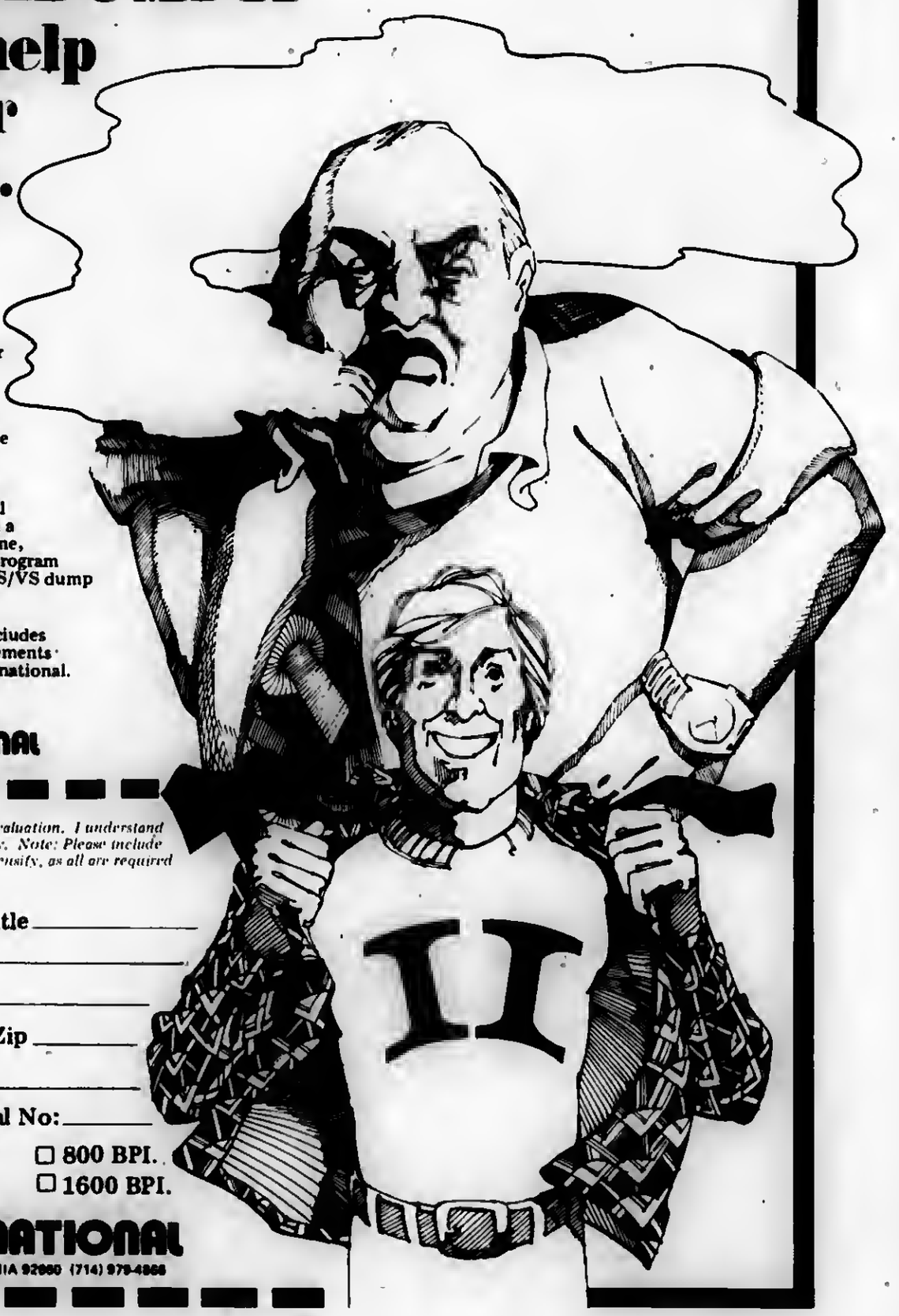
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'Cost of Ownership' Emphasized

Lower Cost of Printers Linked to Mini Market Growth

By Molly Upton
Of the CW Staff

SAN FRANCISCO – The growth of the minicomputer market has influenced the trend toward lower cost printers and lower cost of operation, Ted L. Nichols of General Automation, Inc. (GA) told attendees at a Wescon session.

Future trends to counter increased paper costs include more concentrated print capability as well as the ability to use recycled paper, he said. Nichols is GA's manager of peripheral products.

"This emphasis on lowering the operating cost shows a maturing of the industry and a recognition of the total cost of ownership," he told attendees at a session entitled "So You Want a Printer for Your Mini or Microcomputer System?"

Nichols predicted nonimpact printers will probably be the leading printing technique in the early 1980s. "The chain, train and band technologies are taking over and probably will be in the forefront during the next five years," he said.

CW At Wescon

At first, emphasis in the industry was on achieving suitable reliability, then on print quality. With the advent of minicomputers, the emphasis on cost arose, he said.

With the growth of the minicomputer applications, printer makers have filled the void that previously existed between the $1,000 and $50,000 printers, he said.

Current constraints for mini and micro applications are "such things as network data rates for communications-oriented applications, the processor time available in multiprocessing industrial applications or perhaps even the CPU speed itself in LSI microcomputers," he said.

In selecting the printer for minicomputers and microcomputers, buyers should examine thoroughly the financial aspects, evaluate the particular application and the manufacturer, he said.

The financial aspects of selection include the costs of operation, integration and support as well as the initial investment, he said.

In evaluating the application, the buyer should consider print volume, data source, formats, copies, environmental constraints, maintenance plans and financial considerations, Nichols said.

To select a supplier, one should look at the basis for cost comparisons, vendor support, commitments and agreements and how to determine the vendor's quality awareness, he said.

In determining costs of printers, Nichols told prospective buyers to look at the cost over the life of the product.

Once operating costs are established, one can determine the operating costs per line or per month by knowing the volume of printing required, he said.

The cost of integrating the printer into the system should be added to the cost of the system, and support costs should be identified. For example, to put two products on an equal basis for a life cost evaluation, it may be necessary to include refurbishment expenses as well, he said.

Overriding Criterion

Because the higher the speed, the lower the cost per page, the printer speed requirement is "perhaps the overriding criterion in establishing the application requirements," he said.

This general guideline exists despite the fact that unit cost generally rises with the speed of the printer.

Although the workload per day or per shift is "adequate for an off-line print station, the peak load on an hourly basis is a better criteria for one-line units," he said.

In evaluating the choices for specific applications, the parameter of speed of operation is "rather deceptive for most applications," he observed.

Line length and carriage return techniques can affect the printing speed of character-oriented printers, he observed.

Seldom-quoted specifications, although often important in affecting throughput, are the time required for carriage return and line-spacing operation, he said.

Line printer speeds are also affected by variables such as the size of the character set, response time and the transfer rate of the data source, he said.

Other application criteria are data source and print format.

If preprinted forms are to be used, nonimpact printers usually are not applicable, he said.

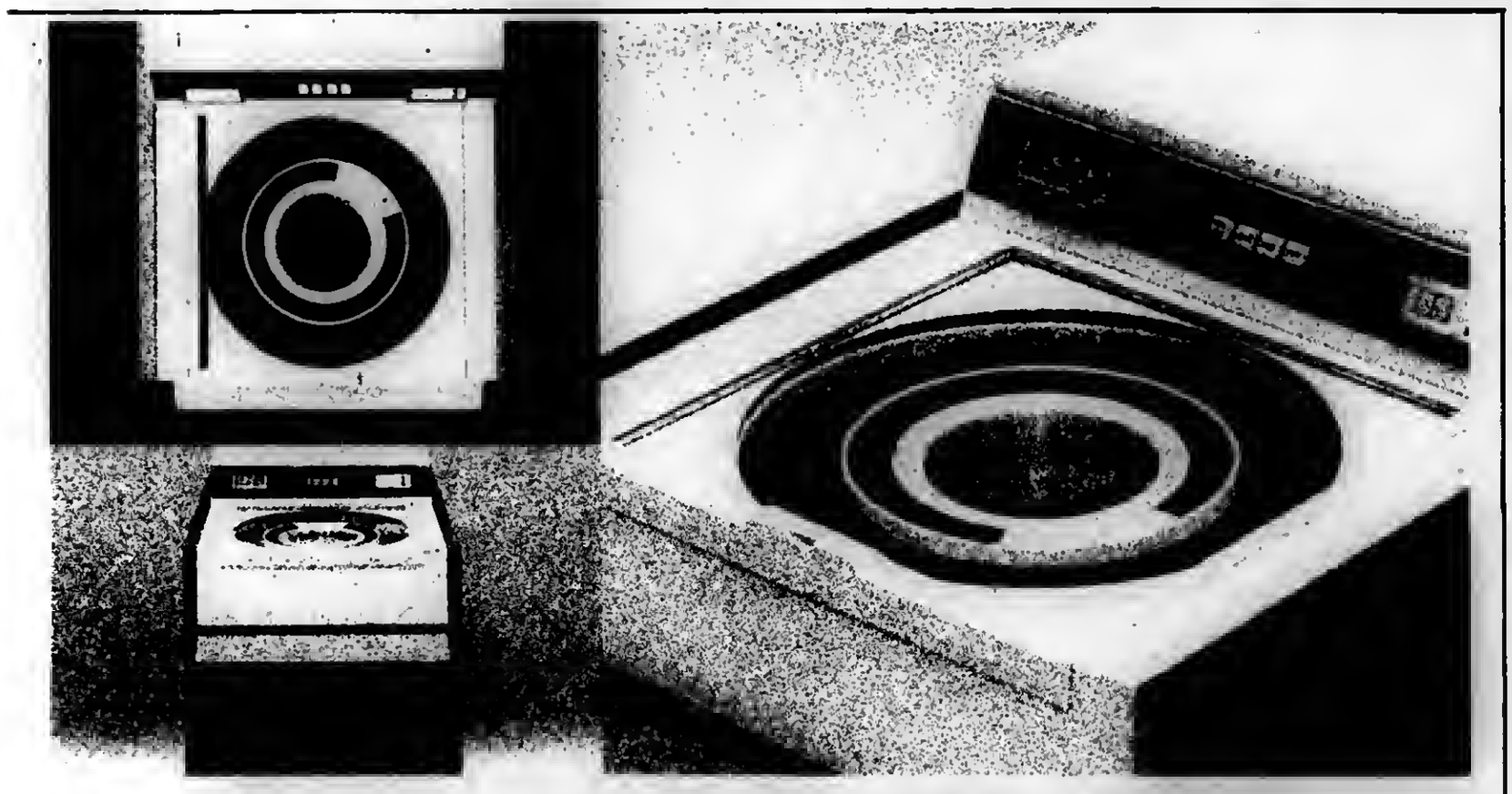
Another consideration, for which specifications are difficult to obtain, is noise. These specs are hard to compare due to the variances in measuring conditions.

Elimination Easy

"Provided the application requirements have been clearly defined, it is fairly easy to eliminate most of" the 200 or more printers available, Nichols said.

The evaluation of the eligible units is primarily a matter of trade-offs, he said. "Product performance, features, reliability and support are measured against initial prices and continuing costs on a product life basis," he said.

Features to benefit both the logic designer, system engineer, use and maintenance personnel all need to be considered, he said.



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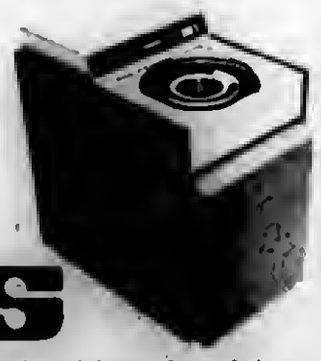
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Statistical Tabulating Corp. has ordered 11 System 380s with 127 keystations from Entrex, Inc. to replace existing data entry equipment.

The U.S. Railway Association has ordered the Model 204 data base management system from Computer Corp. of America to set up a data base describing the geography of the northeast U.S.

Thirty NCR 279 terminals have been installed at teller windows and other customer service areas of Western Bank of Houston in a move toward implementating a real-time central information file.

Alterman Brothers of Atlanta has ordered a Univac 90/30 for use in its institutional food distribution operations.

The Tano Corp. will install a computer-controlled test set at the *St. Petersburg Times* to facilitate testing and maintenance of the newspaper computer system.

Johnson County, Iowa, has ordered a Hewlett-Packard 3000 Model 50CX mini to carry out the statistical operations of its government departments.

A computer-assisted instruction system designed by the Computer Curriculum Corp, has been installed in the Fort Worth, Texas, Independent School District.

The Johnson Space Center has installed two System 2000s from MRI Systems Corp.

General Electric Credit Corp. has ordered Bunker Ramo's System 90 programmable video terminals and GE teleprinters to provide an on-line inquiry/response system to perform credit functions.

Palais Royal, a department store chain, has installed a credit authorization system designed and built by TRW Data Systems.

Standard Oil Co. of Ohio has ordered two Key-Edit 1000 systems and one Key-Edit 60 system for daily data entry requirements.

Blyth Eastman Dillon and Co. has ordered 100 visual display units controlled by SPD 20/20 terminal processing units and 50 SPD P-100 high-speed printers from Incoterm Corp.

The Consumer Electronics Division of RCA Corp. has ordered a Univac 90/70 system as part of its plan to consolidate all DP for the division.

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Correction Notice!

Due to an oversight, Key Equipment Corp.'s ad did not run within the classified section of *Computerworld*'s Sept. 17 issue. Please see their current ad on page 50 of this issue.

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NCR:
Bank Proof Models: 450, 482.
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31-10-14(24). 32-10-14(38).
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1	915	OCR Page Reader
1	1735	Pege Reader Cntrlr*
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1	609	Meg Tepe Trensport
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1	1708	Storage Increment-4K
1	1708	Storage Increment-4K
1	1708	Storage Increment-4K
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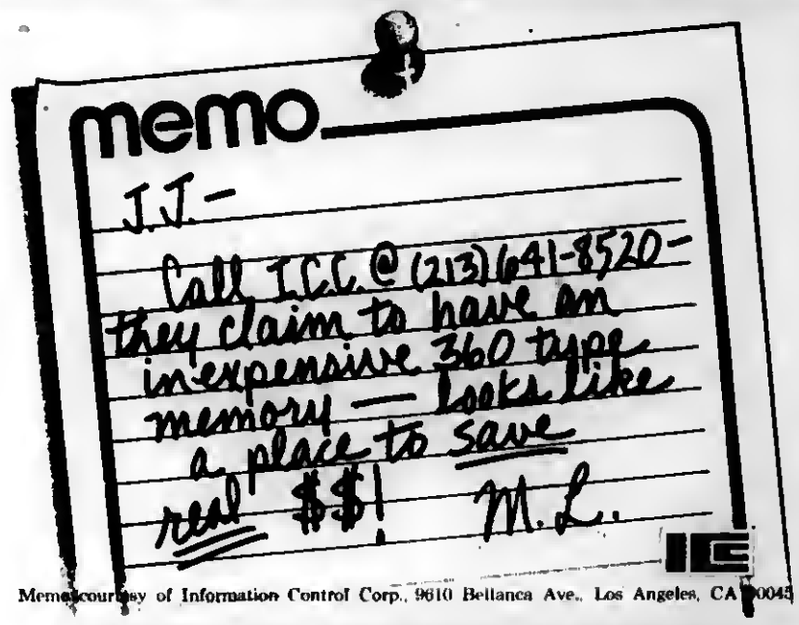
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Two Time-Sharing Firms Up Revenues

Two time-sharing firms reported increased revenues for the various periods ended June 30. Tymshare, Inc.'s earnings for the second quarter and six months improved while Comshare, Inc. showed reduced earnings, despite more than a 100% rise in operating income for both the fourth quarter and year.

Tymshare's second-quarter revenues rose 23% to nearly $14 million compared with $11.4 million in the year-ago period.

Earnings totaled $1.1 million or 30 cents a share compared with $791,154 or 21 cents a share in the year-ago period.

During the six months, Tymshare's revenues rose to nearly $28 million compared with $22.6 million in the same period last year while earnings rose to $2.3 million or 61 cents a share compared with $1.6 million or 42 cents a share in the 1974 half year.

The figures for 1974 were restated to reflect the acquisition of United Data Centers, Inc..

At Comshare, revenues for 1975 rose 30% to $12.3 million compared with $9.5 million in 1974. Income from operations more than doubled to $1.5 million from $649,422 in 1974.

However, the firm earned nearly $1.5 million or $1.10 a share compared with $1.5 million or $1.13 a share last year.

The 1974 figures were restated to reflect a change in accounting to directly expense software and systems development costs as incurred.

During the fourth quarter, Comshare's revenues rose to $3.5 million compared with $2.5 million during the year-ago period.

Earnings dropped to $335,401 or 24 cents a share compared with $710,327 or 54 cents a share in the year-ago period.

CSC Quarter Net Increases 160%

EL SEGUNDO, Calif. – Computer Sciences Corp. (CSC) reported earnings growth and record revenues for the first quarter ended June 27.

Earnings for the quarter totaled $1.5 million or 11 cents a share, a 160% gain over the $585,000 or 4 cents a share recorded in the year-ago period.

Revenues for the quarter rose to $50.4 million, a gain of nearly 27% over the $39.7 million posted last year.

Both the contract services and Infonet sectors of the company's business contributed significantly to the profit improvement in the first quarter, William R. Hoover, chairman and president of CSC, said.

DPF Reports Earnings in the Black Despite Decline in '75 Revenues

HARTSDALE, N.Y. – Lessor DPF, Inc. wrote its 1975 earnings in black ink both on an operating basis and after special credits.

On an operating basis, the firm's income was $379,000 compared with a $4.8 million loss in 1974.

After tallying special credits, such as a $2.2 million gain on repurchase of debentures and a $2.3 million tax credit, earnings totaled $4.9 million or $1.19 a share compared with a loss of $3.4 million during 1974. During 1974, DPF wrote off $5.4 million on the core memory portion of its 360 equipment.

Revenues, however, declined to nearly $25.5 million from $31.5 million in the year ended May 31, 1974.

During the year, DPF applied $17 million in internally generated funds to reduce obligations and made final installment payments on 360 inventory.

Secured debt and bank loans were cut to $965,000 from $11.3 million a year ago, and convertible subordinated debentures stood at $21.6 million compared with $31.5 million on May 31, 1974.

The company authorized a budget of $5 million to be invested in expansion of its systems leasing business.

For the fourth quarter, revenues also declined to $5.4 million compared with $8.6 million in the year-ago period.

Earnings, including special credits, totaled $571,000 or 14 cents a share compared with a loss of $4.4 million in the same period last year.

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Earnings Reports

TELEX
Three Months Ended June 30

	1975	1974
Shr Ernd	$.19	$.02
Revenue	27,508,000	29,495,000
Tax Cred	635,000	.....
Earnings	1,972,000	165,000

TEKTRONIX
Year Ended May 31

	a1975	1974
Shr Ernd	$3.04	$2.47
Revenue	336,645,000	271,428,000
Earnings	26,329,000	21,353,000

a-Reflects change to Lifo method of inventory valuation.

WANG LABORATORIES
Year Ended June 30

	1975	1974
Shr Ernd	$.80	$1.20
Revenue	75,828,000	63,877,000
Earnings	3,255,000	4,869,000
3 Mo Shr	.36	.46
Revenue	24,893,000	20,026,000
Earnings	1,470,000	1,883,000

GRAHAM MAGNETICS
Year Ended June 30

	1975	1974
Shr Ernd	$1.33	$1.46
Revenue	15,793,000	15,289,000
Earnings	1,248,611	1,368,276

COMPUTER TRANSCEIVER SYSTEMS
Year Ended Feb. 28

	1975	a1974
Shr Ernd	$.58	$.53
Revenue	4,381,354	3,988,732
Tax Cred	246,700	224,500
Earnings	527,486	481,094

a-Restated.

WANGCO
Three Months Ended June 30

	1975	1974
Shr Ernd	$.16	$.40
Revenue	5,220,226	4,949,879
Earnings	171,035	434,096
9 Mo Shr	.47	1.12
Revenue	14,300,999	12,800,701
Earnings	495,288	1,227,349

BUNKER RAMO
Three Months Ended June 30

	1975	a1974
Shr Ernd	.....	$.19
Revenue	$76,444,000	82,380,000
Earnings	(262,000)	1,745,000
6 Mo Shr	.....	.52
Revenue	148,189,000	159,303,000
Earnings	(1,170,000)	4,290,000

a-Restated.

AMPEX
Three Months Ended Aug. 2

	1975	a1974
Shr Ernd	$.14	$1.21
Revenue	63,655,000	61,342,000
Disc Op	.....	(15,000)
Tax Crad	607,000	5,510,000
Earnings	1,559,000	13,125,000

a-Restated for discontinued operations.

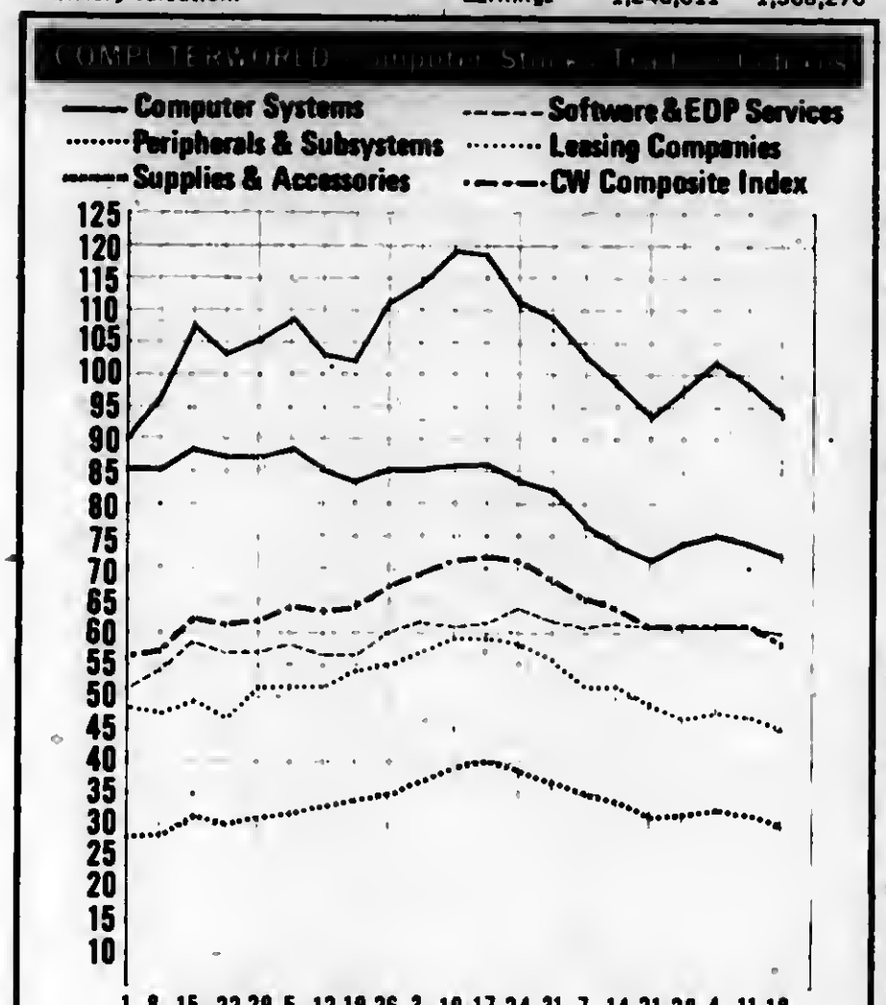
CENTRONICS OATA COMPUTER
Year Ended June 30

	1975	1974
Shr Ernd	$1.52	$1.65
Revenue	41,500,000	41,500,000
Earnings	7,258,000	7,931,000
3 Mo Shr	.35	.47
Revenue	10,500,000	12,100,000
Earnings	1,676,000	2,264,000

BOLT, BERANEK & NEWMAN
Year Ended June 30

	1975	1974
5hr Ernd	$1.03	$1.02
Revenue	28,688,000	22,079,900
Earnings	a1,271,100	1,269,600
3 Mo Shr	.14	.30
Revenue	8,049,500	6,399,400
Earnings	176,300	370,900

a-Includes gain of $308,300 from exchange of nonexclusive license.



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Computerworld Stock Trading Summary

CLOSING RRICES WEDNESDAY, SERTEMBER 17, 1975

All statistics compiled, computed and formatted by TRAOE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		RRICE 1975 RANGE (1)	CLOSE SEP 17 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORR	62-109	84 3/8	-2 5/8	-3.0
C	COMPUTER AUTOMATION	2- 10	8 7/8	+ 1/4	+2.8
A	CONTROL DATA CORP	11- 23	15 3/8	- 5/8	-3.9
N	DATA GENERAL CORR	10- 38	26 1/4	- 7/8	-3.2
O	DATAPOINT CORR	6- 26	18 1/2	- 3/4	-3.8
C	DIGITAL COMR CONTROL	1- 4	2 1/2	- 3/4	-23.0
N	DIGITAL EQUIPMENT	46-122	108 1/2	-3	-2.6
M	ELECTRONIC ASSOC.	2- 3	2 3/8	- 1/8	-5.0
A	ELECTRONIC ENGINEER.	5- 10	8 1/4	- 1/4	-2.9
A	EOXBORO	23- 42	25 1/4	- 7/8	-3.3
O	GENERAL AUTOMATION	6- 14	6 3/4	- 3/8	-5.2
C	GRI COMPUTER CORR	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	98-120	91	+ 7/8	+0.9
N	HONEYWELL INC	22- 40	27 5/8	-1 7/8	-6.3
M	IRM	158-224	179 3/4	+ 3/4	+0.4
C	MENOREX	1- 10	6 7/8	- 1/8	-1.7
C	MICRODATA CORR	2- 6	5	- 1/2	-9.0
C	MODULAR COMPUTER SYS	5- 19	11 3/4	- 1/4	-2.0
N	MCR	15- 39	25 3/4	-1	-3.7
O	PRIME COMPUTER INC	2- 6	4 3/4	- 1/4	-5.0
N	RERKIN-ELMER	16- 30	23 1/8	- 7/8	-3.6
N	RAYTHEON CO	26- 59	48 3/4	-4 1/2	-8.4
N	SINGER COMPANY	10- 17	11 3/4	- 5/8	-5.0
N	SPERRY RAND	26- 49	35 3/4	-1 1/2	-4.0
A	SYSTENS ENG. LABS	1- 5	3 1/8	0	0.0
O	ULTIMATE SYSTEMS INC	1- 6	5 5/8	0	0.0
A	VARIAN ASSOCIATES	7- 18	12 7/8	- 5/8	-4.6
N	WANG LABS.	7- 17	9 3/8	-2 1/8	-18.4
N	XEROX CORP	51- 86	53	+ 3/4	+1.4
	LEASING COMPANIES				
C	COMPISCO INC	1- 5	3 3/8	+ 1/8	+3.8
A	COMMERCE GROUP CORR	2- 4	2 5/8	- 3/8	-12.5
A	COMPUTER INVSTRS GRP	1- 2	1/2	- 1/8	-20.0
P	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	1- 1	1/2	0	0.0
N	DPE INC	3- 6	4 3/4	- 1/8	-2.5
O	EOP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/8	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 1/2	- 3/8	-13.0
A	ITEL	3- 9	6	+ 1/4	+4.3
N	LEASCO CORP	4- 8	5 1/2	0	0.0
O	LEASPAC CORR	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
C	MRG INC	1- 4	1 5/8	- 3/4	-31.5
A	RICNFER TEX CORP	2- 7	5	+ 1/4	+5.2
A	ROCKWOOD COMPUTER	1- 1	1/4	0	0.0
N	U.S. LEASING	7- 14	7	- 1/2	-6.6

EXCH		RRICE 1975 RANGE (1)	CLOSE SEP 17 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
C	ADVANCED COMR TECH	1- 1	1	+ 1/8	+14.2
A	ARRLIED DATA RES.	1- 10	1 5/8	- 1/8	-7.1
M	AUTOMATIC DATA PROC	29- 65	45 3/4	-5 3/4	-11.1
C	BRANDON ARRLIED SYST	1- 1	1/8	0	0.0
C	CENTRAL DATA SYSTEMS	3- 7	6 5/8	0	0.0
C	COMPUTER DIMENSIONS	2- 6	3 3/4	- 1/4	-6.2
C	COMP ELECTION SYSTMS	3- 6	5 1/4	- 1/4	-4.5
C	COMPUTER HORIZONS	1- 1	3/4	0	0.0
C	COMPUTER NETWORK	1- 3	2 5/8	+ 1/4	+10.5
A	COMPUTER SCIENCES	2- 6	5	- 1/8	-2.4
C	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
C	COMPUTER USAGE	2- 4	2 1/8	- 1/8	-5.5
C	COMSHARE	3- 4	2 7/8	0	0.0
C	DATATAB	1- 2	1 3/8	- 1/4	-15.3
A	ELECT COMR RROD	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	15 1/2	0	0.0
C	INFONATIONAL INC	1- 1	1/8	0	0.0
C	IPS COMPUTER MARKIT.	1- 1	5/8	- 1/8	-16.6
C	KEANE ASSOCIATES	2- 3	2	- 1/8	-5.8
O	KEYDATA CORR	2- 3	2 3/8	0	0.0
C	LOGICON	3- 5	3 3/4	0	0.0
A	MANAGEMENT DATA	1- 3	1 7/8	0	0.0
C	NATIONAL CSS INC	6- 14	10 5/8	-1 7/8	-15.0
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	OM LINE SYSTEMS INC	8- 17	11	- 3/4	-6.3
N	PLANNING RESEARCH	2- 6	3 3/4	- 1/4	-6.2
C	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	3 3/8	0	0.0
O	REYNOLDS & REYNOLD	10- 24	11	- 1/2	-4.3
C	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
C	SIMPLICITY COMPUTER	1- 1	1 1/8	+ 1/4	+28.5
O	TYMSHARE INC	7- 21	16 3/4	- 3/8	-2.1
A	URS SYSTEMS	2- 4	3 3/8	+ 1/8	+3.8
N	WYLY CORP	2- 4	3	- 1/8	-4.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	7 5/8	+ 5/8	+8.9
O	ADVANCED MEMORY SYS	1- 7	4 3/8	+ 1/8	+2.9
N	AMREX CORR	3- 7	4 7/8	- 3/8	-7.1
C	AMDERSON JACOBSON	1- 3	1 3/4	- 1/2	-22.2
O	BEEHIVE MEDICAL ELEC	1- 5	3 1/8	+ 1/4	+8.6
A	BOLT,BERANEK & NEW	5- 13	9 5/8	- 1/4	-2.5
N	BUNKER-RAMO	4- 8	4 3/4	+ 1/4	+5.5
A	CALCOMP	4- 7	3 3/4	0	0.0
C	CAMBRIDGE MEMORIES	3- 5	2 3/4	- 3/4	-21.4
N	CENTRONICS DATA COMP	7- 25	14 5/8	- 5/8	-4.0
O	CODEX CORR	15- 38	30 3/4	-2 1/4	-6.8
O	COGNITRONICS	1- 2	3/4	- 1/4	-25.0
C	COMPUTER COMMUN.	1- 2	1	0	0.0
O	COMPUTER CONSOLES	3- 7	3 3/4	0	0.0
A	COMPUTER EQUIPMENT	1- 2	1 3/4	+ 1/8	+7.6
C	CONRUTER MACHINERY	1- 2	1 1/4	- 1/4	-16.6
C	COMPUTER TRANSCEIVER	1- 2	1 1/8	0	0.0
C	CONTEL	2- 5	3	- 1/8	-4.0
A	CONRAC CORP	12- 23	15 3/4	-1 3/4	-10.0

EXCH		RRICE 1975 RANGE (1)	CLOSE SEP 17 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
C	DATA 100	5- 16	8 5/8	- 3/4	-8.0
A	DATA PRODUCTS CORP	2- 6	3 1/4	- 3/8	-10.3
O	DATA TECHNOLOGY	1- 3	1 5/8	0	0.0
O	DATUM INC	1- 2	1 1/8	0	0.0
O	DECISION DATA COMPUT	4- 7	4 1/2	- 1/8	-2.7
O	DELTA DATA SYSTEMS	1- 1	1/8	0	0.0
O	DIGIAM CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC N & M	1- 3	1 5/8	- 1/4	-13.3
O	FABRI-TEK	1- 1	7/8	- 1/8	-12.5
C	GENERAL COMPUTER SYS	1- 2	1	- 1/2	-33.3
M	HAZELTINE CORP	3- 6	4 1/8	+ 1/4	+6.4
N	HARRIS CORP	18- 28	20 3/4	-1 3/4	-7.7
A	INCOTERM CORP	3- 12	9 1/8	- 3/8	-3.9
O	INEDREX INC	2- 5	2 1/2	- 1/8	-4.7
C	INFORMATION INTL INC	8- 14	10 7/8	+1 1/8	+11.5
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	MILGO ELECTRONICS	8- 24	15 5/8	- 3/8	-2.3
N	MOHAWK DATA SCI .	1- 5	3	- 1/4	-7.6
C	ORLICAL SCANNING	1- 3	3	0	0.0
O	PERKIN CORR	2- 2	1 1/8	- 1/8	-10.0
C	PERTEC CORP	2- 8	4 1/2	- 3/4	-14.2
A	ROTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	3/4	0	0.0
C	QUANTOR CORR	2- 6	5	- 1/8	-2.4
O	RECOGNITION EQUIP	2- 9	5 1/4	- 3/4	-12.5
M	SANDERS ASSOCIATES	3- 11	6 1/4	-1 1/4	-16.6
O	SCAN DATA	1- 3	1 3/4	0	0.0
O	STORAGE TECHNOLOGY	6- 17	11 1/2	- 3/4	-6.1
O	SYCOR INC	5- 15	12 1/2	-1	-7.4
O	T RAR INC	3- 6	5 5/8	0	0.0
O	TALLY CORR.	1- 5	3 1/4	+ 1/8	+4.0
C	TEC INC	1- 4	3	0	0.0
N	TEKTRONIX INC	18- 41	33	-2 1/4	-6.3
N	TELEX	1- 3	2	- 1/4	-11.1
O	WANGCO INC	4- 9	5 5/8	- 3/8	-6.2
C	WILTEK INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
C	BALTIMORE BUS FORMS	4- 5	4 3/4	0	0.0
A	BARRY WRIGHT	5- 7	5 3/4	- 1/4	-4.1
C	CYBERNATICS INC	1- 1	1/2	0	0.0
A	DATA DOCUMENTS	29- 42	32 1/2	-1 3/4	-5.1
C	DUPLEX PRODUCTS INC	12- 25	16	- 1/8	-0.7
N	EMNIS BUS. FORMS	5- 7	5	- 3/8	-6.9
O	GRAHAM MAGNETICS	5- 10	8 1/4	- 1/4	-2.9
C	GRAPHIC CONTROLS	8- 21	11 3/4	+ 1/4	+2.1
N	3M COMPANY	43- 68	49 5/8	-3 5/8	-6.8
C	MOORE CORP LTD	39- 51	43 1/4	-1	-2.2
N	NASHUA CORR	11- 22	11 1/8	- 5/8	-5.3
O	STANDARD REGISTER	11- 20	15 1/2	- 1/2	-3.1
O	TAB PRODUCTS CO	4- 8	6	0	0.0
N	UARCO	17- 24	19 1/4	+ 1/4	+1.3
C	VANIER GRAPHICS CORP	4- 7	4 1/2	+ 1/4	+5.8
A	WABASH MAGNETICS	3- 5	4	- 1/8	-3.0
M	WALLACE BUS FORMS	15- 25	16 1/8	- 3/8	-2.2

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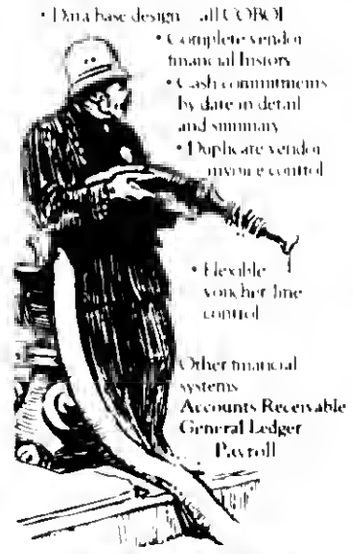
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In Three Months

Two Time-Sharing Firms Up Revenues

Two time-sharing firms reported increased revenues for the various periods ended June 30. Tymshare, Inc.'s earnings for the second quarter and six months improved while Comshare, Inc. showed reduced earnings, despite more than a 100% rise in operating income for both the fourth quarter and year.

Tymshare's second-quarter revenues rose 23% to nearly $14 million compared with $11.4 million in the year-ago period.

Earnings totaled $1.1 million or 30 cents a share compared with $791,154 or 21 cents a share in the year-ago period.

During the six months, Tymshare's revenues rose to nearly $28 million compared with $22.6 million in the same period last year while earnings rose to $2.3 million or 61 cents a share compared with $1.6 million or 42 cents a share in the 1974 half year.

The figures for 1974 were restated to reflect the acquisition of United Data Centers, Inc..

At Comshare, revenues for 1975 rose 30% to $12.3 million compared with $9.5 million in 1974. Income from operations more than doubled to $1.5 million from $649,422 in 1974.

However, the firm earned nearly $1.5 million or $1.10 a share compared with $1.5 million or $1.13 a share last year.

The 1974 figures were restated to reflect a change in accounting to directly expense software and systems development costs as incurred.

During the fourth quarter, Comshare's revenues rose to $3.5 million compared with $2.5 million during the year-ago period.

Earnings dropped to $335,401 or 24 cents a share compared with $710,327 or 54 cents a share in the year-ago period.

CSC Quarter Net Increases 160%

EL SEGUNDO, Calif. – Computer Sciences Corp. (CSC) reported earnings growth and record revenues for the first quarter ended June 27.

Earnings for the quarter totaled $1.5 million or 11 cents a share, a 160% gain over the $585,000 or 4 cents a share recorded in the year-ago period.

Revenues for the quarter rose to $50.4 million, a gain of nearly 27% over the $39.7 million posted last year.

Both the contract services and Infonet sectors of the company's business contributed significantly to the profit improvement in the first quarter, William R. Hoover, chairman and president of CSC, said.

DPF Reports Earnings in the Black Despite Decline in '75 Revenues

HARTSDALE, N.Y. – Lessor DPF, Inc. wrote its 1975 earnings in black ink both on an operating basis and after special credits.

On an operating basis, the firm's income was $379,000 compared with a $4.8 million loss in 1974.

After tallying special credits, such as a $2.2 million gain on repurchase of debentures and a $2.3 million tax credit, earnings totaled $4.9 million or $1.19 a share compared with a loss of $3.4 million during 1974. During 1974, DPF wrote off $5.4 million on the core memory portion of its 360 equipment.

Revenues, however, declined to nearly $25.5 million from $31.5 million in the year ended May 31, 1974.

During the year, DPF applied $17 million in internally generated funds to reduce obligations and made final installment payments on 360 inventory.

Secured debt and bank loans were cut to $965,000 from $11.3 million a year ago, and convertible subordinated debentures stood at $21.6 million compared with $31.5 million on May 31, 1974.

The company authorized a budget of $5 million to be invested in expansion of its systems leasing business.

For the fourth quarter, revenues also declined to $5.4 million compared with $8.6 million in the year-ago period.

Earnings, including special credits, totaled $571,000 or 14 cents a share compared with a loss of $4.4 million in the same period last year.

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Earnings Reports

TELEX
Three Months Ended June 30

	1975	1974
Shr Ernd	$.19	$.02
Revenue	27,508,000	29,495,000
Tax Cred	635,000	.....
Earnings	1,972,000	165,000

TEKTRONIX
Year Ended May 31

	a1975	1974
Shr Ernd	$3.04	$2.47
Revenue	336,645,000	271,428,000
Earnings	26,329,000	21,353,000

a-Reflects change to Lifo method of inventory valuation.

WANG LABORATORIES
Yeer Ended June 30

	1975	1974
Shr Ernd	$.80	$1.20
Revenue	75,828,000	63,877,000
Eernings	3,255,000	4,869,000
3 Mo Shr	.36	.46
Revenue	24,893,000	20,026,000
Earnings	1,470,000	1,883,000

GRAHAM MAGNETICS
Yeer Ended June 30

	1975	1974
Shr Ernd	$1.33	$1.46
Revenue	15,793,000	15,289,000
Earnings	1,248,611	1,368,276

COMPUTER TRANSCEIVER SYSTEMS
Year Ended Feb. 28

	1975	a1974
Shr Ernd	$.58	$.53
Revenue	4,381,354	3,988,732
Tax Cred	246,700	224,500
Earnings	527,486	481,094

e-Restaled.

WANGCO
Three Months Ended June 30

	1975	1974
Shr Ernd	$.16	$.40
Revenue	5,220,226	4,949,879
Earnings	171,035	434,096
9 Mo Shr	.47	1.12
Revenue	14,300,999	12,800,701
Earnings	495,288	1,227,349

BUNKER RAMO
Three Months Ended June 30

	1975	a1974
Shr Ernd	.....	$.19
Revenue	$76,444,000	82,380,000
Earnings	(262,000)	1,745,000
6 Mo Shr	.....	.52
Revenue	148,189,000	159,303,000
Eernings	(1,170,000)	4,290,000

a-Restated.

AMPEX
Three Months Ended Aug. 2

	1975	a1974
Shr Ernd	$.14	$1.21
Revenue	63,655,000	61,342,000
Disc Op	.....	(15,000)
Tax Cred	607,000	5,510,000
Earnings	1,559,000	13,125,000

a-Resteted for discontinued operetions.

CENTRONICS DATA COMPUTER
Year Ended June 30

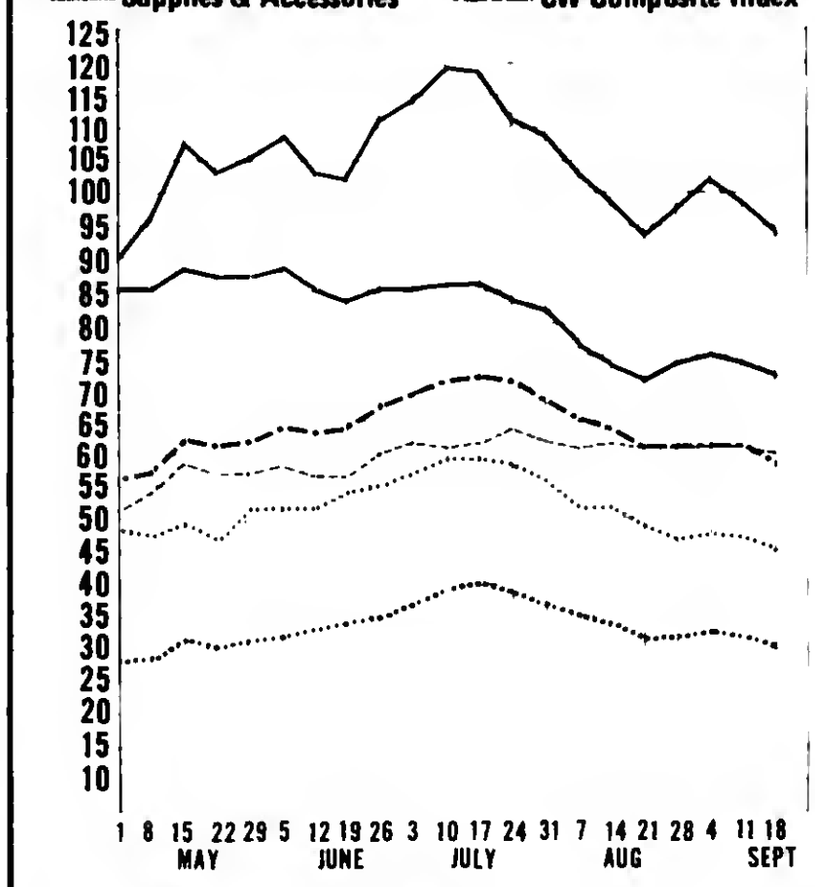
	1975	1974
Shr Ernd	$1.52	$1.65
Revenue	41,500,000	41,500,000
Earnings	7,258,000	7,931,000
3 Mo Shr	.35	.47
Revenue	10,500,000	12,100,000
Eernings	1,676,000	2,264,000

BOLT, BERANEK & NEWMAN
Yeer Ended June 30

	1975	1974
Shr Ernd	$1.03	$1.02
Revenue	28,688,000	22,079,900
Eernings	a1,271,100	1,269,600
3 Mo Shr	.14	.30
Revenue	8,049,500	6,399,400
Eernings	176,300	370,900

e-Includes geln of $308,300 lrom exchenge of nonexclusive license.

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Computerworld Stock Trading Summary

CLOSING PRICES WEONESDAY, SEPTEMBER 17, 1975

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1975 RANGE (1)	CLOSE SEP 17 1975	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	84 3/8	-2 5/8	-3.0
C	COMPUTER AUTOMATION	2- 10	8 7/8	+ 1/4	+2.8
N	CONTROL DATA CORP	11- 23	15 3/8	- 5/8	-3.9
N	DATA GENERAL CORP	10- 38	26 1/4	- 7/8	-3.2
O	DATAPOINT CORP	6- 26	18 1/2	- 3/4	-3.8
C	DIGITAL COMP CONTROL	1- 4	2 1/2	- 3/4	-23.0
N	DIGITAL EQUIPMENT	46-122	108 1/2	-3	-2.6
N	ELECTRONIC ASSOC.	2- 3	2 3/8	- 1/8	-5.0
A	ELECTRONIC ENGINEER.	5- 10	8 1/4	- 1/4	-2.9
N	FOXBORO	23- 42	25 1/4	- 7/8	-3.3
O	GENERAL AUTOMATION	6- 14	6 3/4	- 3/8	-5.2
C	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	58-120	91	+ 7/8	+0.9
N	HONEYWELL INC	22- 40	27 5/8	-1 7/8	-6.3
N	IBM	158-224	179 3/4	+ 3/4	+0.4
C	MEMOREX	1- 10	6 7/8	- 1/8	-1.7
C	MICRODATA CORP	2- 6	5	- 1/2	-9.0
C	MODULAR COMPUTER SYS	5- 19	11 3/4	- 1/4	-2.0
N	NCR	15- 39	25 3/4	-1	-3.7
O	PRIME COMPUTER INC	2- 6	4 3/4	- 1/4	-5.0
N	PERKIN-ELMER	16- 30	23 1/8	- 7/8	-3.6
N	RAYTHEON CO	26- 59	48 3/4	-4 1/2	-8.4
N	SINGER COMPANY	10- 17	11 3/4	- 5/8	-5.0
N	SPERRY RAND	26- 49	35 3/4	-1 1/2	-4.0
A	SYSTEMS ENG. LABS	1- 5	3 1/8	0	0.0
O	ULTIMATE SYSTEMS INC	1- 6	5 5/8	0	0.0
A	VARIAN ASSOCIATES	7- 18	12 7/8	- 5/8	-4.6
N	WANG LABS.	7- 17	9 3/8	-2 1/8	-18.4
N	XEROX CORP	51- 86	53	+ 3/4	+1.4

LEASING COMPANIES

C	COMDISCO INC	1- 5	3 3/8	+ 1/8	+3.8
A	COMMERCE GROUP CORP	2- 4	2 5/8	- 3/8	-12.5
A	COMPUTER INVSTRS GRP	1- 2	1/2	- 1/8	-20.0
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	1- 1	1/2	0	0.0
N	DPF INC	3- 6	4 3/4	- 1/8	-2.5
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/8	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 1/2	- 3/8	-13.0
A	ITEL	3- 9	6	+ 1/4	+4.3
N	LEASCO CORP	4- 8	5 1/2	0	0.0
O	LEASPAC CORP	1- 1	1/4	0	0.0
C	LECTRO MGT INC	1- 1	1/8	0	0.0
C	NRG INC	1- 4	1 5/8	- 3/4	-31.5
A	PIONEER TEX CORP	2- 7	5	+ 1/4	+5.2
A	ROCKWOOD COMPUTER	1- 1	1/4	0	0.0
N	U.S. LEASING	7- 14	7	- 1/2	-6.6

SOFTWARE & EDP SERVICES

C	ADVANCED COMP TELE	1- 1	1	+ 1/8	+14.2
A	APPLIED DATA RES.	1- 10	1 5/8	- 1/8	-7.1
N	AUTOMATIC DATA PROC	29- 65	45 3/4	-5 3/4	-11.1
C	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
C	CENTRAL DATA SYSTEMS	3- 7	6 5/8	0	0.0
C	COMPUTER DIMENSIONS	2- 6	3 3/4	- 1/4	-6.2
C	COMP ELECTION SYSTMS	3- 6	5 1/4	- 1/4	-4.5
C	COMPUTER HORIZONS	1- 1	3/4	0	0.0
C	COMPUTER NETWORK	1- 3	2 5/8	+ 1/4	+10.5
A	COMPUTER SCIENCES	2- 6	5	- 1/8	-2.4
C	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
C	COMPUTER USAGE	2- 4	2 1/8	- 1/8	-5.5
C	COMSHARE	3- 4	2 7/8	0	0.0
C	CATATAB	1- 2	1 3/8	- 1/4	-15.3
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	15 1/2	0	0.0
C	INFONATIONAL INC	1- 1	1/8	0	0.0
C	IPS COMPUTER MARKET.	1- 1	5/8	- 1/8	-16.6
C	KEANE ASSOCIATES	2- 3	2	- 1/8	-5.8
O	KEYDATA CORP	2- 3	2 3/8	0	0.0
C	LOGICON	3- 5	3 3/4	0	0.0
A	MANAGEMENT DATA	1- 3	1 7/8	0	0.0
C	NATIONAL CSS INC	6- 14	10 5/8	-1 1/8	-15.0
C	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	11	- 3/4	-6.3
N	PLANNING RESEARCH	2- 6	3 3/4	- 1/4	-6.2
C	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	3 3/8	0	0.0
O	REYNOLDS & REYNOLD	10- 24	11	- 1/2	-4.3
C	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
C	SIMPLICITY COMPUTER	1- 1	1 1/8	+ 1/4	+28.5
C	TYMSHARE INC	7- 21	16 3/4	- 3/8	-2.1
A	LRS SYSTEMS	2- 4	3 3/8	+ 1/8	+3.8
N	WYLY CORP	2- 4	3	- 1/8	-4.0

PERIPHERALS & SUBSYSTEMS

N	ADDRESSOGRAPH-MULT	4- 9	7 5/8	+ 5/8	+8.9
O	ADVANCED MEMORY SYS	1- 7	4 3/8	+ 1/8	+2.9
N	AMPEX CORP	3- 7	4 7/8	- 3/8	-7.1
G	ANDERSON JACOBSEN	1- 3	1 3/4	- 1/2	-22.2
C	BEEHIVE MEDICAL ELEC	1- 5	3 1/8	+ 1/4	+8.6
A	BOLT,BERANEK & NEW	5- 13	9 5/8	- 1/4	-2.5
N	BUNKER-RAMO	4- 8	4 3/4	+ 1/4	+5.5
A	CALCOMP	4- 7	3 3/4	0	0.0
L	CAMBRIDGE MEMORIES	3- 5	2 3/4	- 3/4	-21.4
N	CENTRONICS DATA COMP	7- 25	14 5/8	- 5/8	-4.0
G	CODEX CORP	15- 38	30 3/4	-2 1/4	-6.8
C	COGNITRONICS	1- 2	3/4	- 1/4	-25.0
C	COMPUTER COMMUN.	1- 2	1	0	0.0
C	COMPUTER CONSOLES	3- 7	3 3/4	0	0.0
A	COMPUTER EQUIPMENT	1- 2	1 3/4	+ 1/8	+7.6
C	COMPUTER MACHINERY	1- 2	1 1/4	- 1/4	-16.6
C	COMPUTER TRANSCEIVER	1- 2	1 1/8	0	0.0
C	CONTEN	2- 5	3	- 1/8	-4.0
A	CONRAC CORP	12- 23	15 3/4	-1 3/4	-10.0
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
C	DATA 100	5- 16	8 5/8	- 3/4	-8.0
A	DATA PRODUCTS CORP	2- 6	3 1/4	- 3/8	-10.3
O	DATA TECHNOLOGY	1- 3	1 5/8	0	0.0
O	DATUM INC	1- 2	1 1/8	0	0.0
O	DECISION DATA COMPUT	4- 7	4 1/2	- 1/8	-2.7
C	DELTA DATA SYSTEMS	1- 1	1/8	0	0.0
O	DIAN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	1 5/8	- 1/4	-13.3
O	FABRI-TEK	1- 1	7/8	- 1/8	-12.5
C	GENERAL COMPUTER SYS	1- 2	1	- 1/2	-33.3
N	HAZELTINE CORP	3- 6	4 1/8	+ 1/4	+6.4
N	HARRIS CORP	18- 28	20 3/4	-1 3/4	-7.7
A	INCOTERM CORP	3- 12	9 1/4	- 3/8	-3.9
O	INFOREX INC	2- 5	2 1/2	- 1/8	-4.7
C	INFORMATION INTL INC	8- 14	10 7/8	+1 1/8	+11.5
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	MILGO ELECTRONICS	8- 24	15 5/8	- 3/8	-2.3
N	MOHAWK DATA SCI .	1- 5	3	- 1/4	-7.6
C	OPTICAL SCANNING	1- 3	3	0	0.0
O	PENRIL CORP	2- 2	1 1/8	- 1/8	-10.0
C	PEPTEC CORP	2- 8	4 1/2	- 1/4	-14.2
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	3/4	0	0.0
C	QUANTOR CORP	2- 6	5	- 1/8	-2.4
O	RECOGNITION EQUIP	2- 9	5 1/4	- 3/4	-12.5
N	SANDERS ASSOCIATES	3- 11	6 1/4	-1 1/4	-16.6
O	SCAN DATA	1- 3	1 3/4	0	0.0
O	STORAGE TECHNOLOGY	6- 17	11 1/2	- 3/4	-6.1
O	SYCOR INC	5- 15	12 1/2	-1	-7.4
O	T BAR INC	3- 6	5 5/8	0	0.0
O	TALLY CORP.	1- 5	3 1/4	+ 1/8	+4.0
C	TEC INC	1- 4	3	0	0.0
N	TEKTRONIX INC	18- 41	33	-2 1/4	-6.3
N	TELEX	1- 3	2	- 1/4	-11.1
O	WANGCO INC	4- 9	5 5/8	- 3/8	-6.2
C	WILTEK INC	1- 4	2 1/2	0	0.0

SUPPLIES & ACCESSORIES

C	BALTIMORE BUS FORMS	4- 5	4 3/4	0	0.0
A	BARRY WRIGHT	5- 7	5 3/4	- 1/4	-4.1
C	CYBERMATICS INC	1- 1	1/2	0	0.0
A	DATA DOCUMENTS	29- 42	32 1/2	-1 3/4	-5.1
O	DUPLEX PRODUCTS INC	22- 25	26	- 1/8	-0.7
N	ENNIS BUS. FORMS	5- 7	5	- 3/8	-6.9
O	GRAHAM MAGNETICS	5- 10	8 1/4	- 1/4	-2.9
C	GRAPHIC CONTROLS	8- 21	11 3/4	+ 1/4	+2.1
N	3M COMPANY	43- 68	49 5/8	-3 5/8	-6.8
C	MOORE CORP LTD	39- 51	43 1/4	-1	-2.2
N	NASHUA CORP	11- 22	11 1/8	- 5/8	-5.3
O	STANDARD REGISTER	11- 20	15 1/2	- 1/2	-3.1
O	TAB PRODUCTS CO	4- 8	6	0	0.0
N	UARCO	17- 24	19 1/4	+ 1/4	+1.3
C	VANIER GRAPHICS CORP	4- 7	4 1/2	+ 1/4	+5.8
A	WABASH MAGNETICS	3- 5	4	- 1/8	-3.0
N	WALLACE BUS FORMS	15- 25	16 1/8	- 3/8	-2.2

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NEWSPAPER

U.S.—IBM Reopens With Roar

By Edith Holmes
Of the CW Staff

NEW YORK – U.S. vs. IBM would have resumed with a whimper last week but for the roar of the judge.

Ruling that attorneys for the government and the corporation are simply to note objections concerning documents entered into evidence and ordering that both sides are to stem the tide of motions "inundating" his chambers, Judge David N. Edelstein, chief judge of the U.S. District Court for the Southern District of New York, clamped down on what he fears may be major delaying tactics in this antitrust suit.

Observers noted when the first seven weeks of trial came to a close last July that objections automatically seemed to follow any document entered into evidence.

Two days after the trial reconvened last week following a two-month recess, the judge referred to "a bag full" of motions delivered to his chambers that morning.

That particular bag merely added to the paperwork already covering his desk. "It's impossihle for one man to cope with this – even on a 24-hour basis, absent trial time," Edelstein said.

"What do you hope to accomplish by this? . . . Are you perhaps undercutting your intention to serve the best interests of your client?" he asked.

"In addition to your duty to your client, you have a duty to this court," he said.

Insisting that he was "not playing a

(Continued on Page 2)

IBM Study on Peripherals May Affect Telex vs. IBM

By Vie Farmer
Of the CW Staff

LOS ANGELES – A hefty 103-plus page document uncovered here last week in the discovery phase of an antitrust case brought by a number of West Coast independents against IBM could spark new life into the Telex vs. IBM case.

The document details recommendations to IBM's Management Committee not to enter the plug-compatible market for other vendors' CPUs because both the competitive and economic rewards would not have justified the expenditure of 12- to 15 man-years of time and an average cost of $750,000 per channel interface.

IBM's successful bid to overturn the verdict in the Telex case that it was a monopoly [CW, Feb. 5] hinged heavily on two points – the definition of the plug-compatible peripherals market, which included all other mainframe vendor's products, and the ease with which plug-compatihle interfaces could be built.

The document is a 1971 study entitled "Corporate Marketing Analysis of Should IBM be in the PCM [Plug-Compatihle Manufacture] or OEM [Original Equipment Manufacture] Business" prepared for the IBM management committee at the direction of Warren C. Hume, senior vice-president of IBM and member of the Management Committee.

In arguments before the 10th Circuit Court of Appeals, IBM said peripherals are readily interchangeable with CPUs of different manufacturers and contended the only difference among peripherals plug-compatihle with the CPUs of different manufacturers is the interface.

"The cost of the interface is an insuhstantial portion of the development cost of a peripheral product," IBM said.

The IBM study, on the other hand, concluded that each of these interfaces would require an estimated one-year aver-

(Continued on Page 7)

HEW Privacy Act Tactic Sparks Concern

By Nancy Freneh
Of the CW Staff

WASHINGTON, D.C. – The Privacy Act of 1974 went into effect last Saturday amid congressional concern over a tactic adopted hy the Department of Health, Education and Welfare (HEW) to avoid keeping records on information its own agencies share with one another [CW, Sept. 24].

By defining its 11 separate agencies as one agency for purposes of the Privacy Act, HEW has legally sidestepped the need to keep a set of records that show when one HEW agency accesses the personal data of individuals kept by another HEW agency, critics explained.

If those records of sharing don't exist, individuals who have been granted the right to access them by the Privacy Act have no way of exercising that right, one critic said.

By studying the agency's routine uses, the individual might be ahle to guess what agencies "might have" accessed his personal records, hut would have no way of knowing when and why, he explained.

HEW's official spokesman on the matter denied any wrongdoing in this decision, saying, "On the surface, it may look as though this is the case. In fact, what we have done is to provide tighter controls by centralizing and maintaining that control at the secretary's level.

"We do not intend to allow free exchange of information within the department. Access to information within agencies and hetween agencies is still on a 'need-to-know' basis," he explained.

"The only thing we avoid is the onerous internal recordkeeping. I don't think we are endangering the privacy of the recipients of our programs," he added.

(Continued on Page 5)

TCA Attendees Advised

Efforts to Add Uptime Not Worth Cost

By Ronald A. Frank
Of the CW Staff

SAN DIEGO – Instead of determining how much system downtime he can tolerate, a data communications user should figure out how much system uptime he really needs.

This was the advice given to attendees of an advanced data communications panel session at the Tele-Communications Association's (TCA) annual conference here last week.

"Limited network downtime need not be a disaster," according to Rohert Ritchie, an engineer with the Communications Department of Los Angeles County.

Often the cost of increasing network availahility is not worth the small amount of added service it gives to the users, he said.

The cost of increasing a data communications network uptime from 99.1% to 99.6%, for example, could double the cost of the system because of redundant equipment and other backup features, he said.

In the final analysis, the need for uptime is related directly to the application being served by the network, Ritchie said. In an administrative message system, 4- to 6 hour/mo of system outage may realistically be tolerated – even though, from a political standpoint, this should he limited to 1 hour/mo.

It all depends who in management is using the system, he added.

On the other hand, an on-line order entry system needs the most possible redundancy built in.

Instead of just dying out, such a data communications network must he able to "gracefully degrade" into a reduced throughput mode, he said.

Minis More Available

In general, simple minicomputer-hased networks have a higher availability figure than complex systems with larger mainframes, according to Lewis Hill, staff specialist for computer communications systems at McDonnell Douglas Automation Co.

The IBM Time-Sharing Option (TSO) is an example of a more complex system in which the programs are developed in a time-sharing environment and run in a batch mode, Hill said.

(Continued on Page 4)

Oregon Privacy Law Too Tough, Meets Death After Three Days

By Ann Dooley
Of the CW Staff

SALEM, Ore. – A three-day-old privacy law was killed in a special session of the Oregon Legislature recently because of the tight clamp it placed on all police and court records.

The law, intended to restrict criminal history records unless a justifiable need for access was proven, instead made it impossible for anyone to get any information whatsoever.

If the law had stood, one family member would not be able to discover if another member had been acquitted in a trial. And police could not tell a wife her husband had been arrested.

The law also banned reporters from seeing police arrest and court records. Civil officials would have incurred a $500 fine if they allowed records to be examined or even discussed a criminal case.

Passed last spring in response to concern for inappropriate use of computerized criminal record systems, the law was modeled after the Privacy Act of 1974. Federal exclusions of original records of arrest, trial and disposition were, however, overlooked in the Oregon bill.

When the deletions were discovered, the state Senate passed a new bill with the exclusions. But in the last days of the session, when legislators were hurrying to leave, the House of Representatives did not realize the importance of the new bill and allowed it to die.

The Senate, meanwhile, assumed the new bill had been passed by the House. It was not until a routine review recently that the significance of the House's oversight hecame apparent.

The state attorney general's office declared the law unconstitutional, hut stated that it would have to be enforced until it was changed or overturned by the

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To Our Readers

Computerworld has learned a man calling himself "Michael Stahls" has called several large installations and represented himself as a member of the CW staff.

"Stahls" has been telling the installations he is preparing a special supplement on software and has asked for the names and positions of the installations' DP employees so that he can send them a copy of the supplement.

No "Michael Stahls" is or has ever been an employee of *Computerworld*. Anyone receiving a call from this person is urged to ask him for his name and telephone number and then contact Walter Boyd, president of Computerworld, Inc., at (617) 965-5800 or write Boyd at 797 Washington St., Newton, Mass. 02160.

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U.S.-IBM Trial Reconvenes With Roar

(Continued from Page 1)

game," Thomas D. Barr, lead counsel for IBM, said he knew the paperwork was a great burden on the judge, but felt "the motions are important to my client."

While Edelstein accepted Barr's good intentions so far as his client went, his ruling and order will stand, and observers hope the pace of the trial may pick up as a result.

Sedate Prosecution

Otherwise, the government pursued its case sedately enough, continuing to call industry witnesses to the stand.

Testifying primarily on the market definition aspects of the suit, James H. Binger, chairman of the Executive Committee of Honeywell, Inc., and Clarence W. Spangle, president of Honeywell Information Systems (HIS) and executive vice-president of Honeywell, Inc., took their turns in the witness box.

Much of Binger's testimony revolved around the capital requirements generally held to be dictated by the lease nature of the computer industry. The Honeywell official illustrated this point by mentioning his company's joint venture with Control Data Corp., launched last spring to develop and market magnetic rotating storage devices.

Under cross-examination by IBM counsel, Binger stated neither Honeywell nor CDC would have sought this kind of arrangement had they not faced restraints to their investment in these storage devices and a need to protect, as far as possible, any capital expended.

He characterized the agreement as "an unusual event," prompted not so much by a desire to achieve certain economies of scale as by the need to finance the project.

Binger used Honeywell's limited marketing of its System 58 in the U.S. an an example of how restricted capital can affect a marketing, let alone a development, effort.

He implied financing was a primary motivation behind Honeywell's merger with General Electric's computer operation in 1970.

Both companies recognized the increasing need for large development expendigures, the large capital requirement demanded by a rental-based market and the rapidly changing application areas desired by users. Both felt a larger company need to be formed if either was to survive, Binger said.

Of the control and information systems sides of Honeywell's house, Binger said HIS "requires more capital." HIS has assets of $1.8 billion while the Control Systems Division can get by with $800 million to $1 billion, he noted.

But despite the added investment, HIS generates the same amount of revenue as its counterpart: $1.002 billion. "Capital turnover is slower and so capital requirements are larger for HIS because of the lease nature of the business," Binger said.

In the U.S., 45% of Honeywell's revenue comes from sales and 55% from rental and maintenance of equipment, Binger stated.

"If leasing and renting were not the norm, Honeywell capital requirements would probably be a third of what they are," he said, adding the company would then be freer to take risks developing additional products and markets.

Binger testified Honeywell has not had trouble acquiring financing, but that the price of such funds has often been beyond a range considered "practical" by the corporation.

Peripherals Makers No Competition

On direct examination, the executive commented he did not see the independent peripheral companies as competitors of Honeywell because they did not approach the marketplace from a systems point of view.

While leasing companies, are a factor in the market because they may provide financial arrangements on Honeywell equipment not available from the mainframer, they are not direct competitors, he added.

In their cross-examination of Binger, however, IBM attorneys used Honeywell and other third-party documents to show the corporation did consider companies like Cambridge Memories, Inc., Mohawk Data Sciences and General Computer Systems competitors in the peripherals area.

While he did not deny competition with these firms, Binger indicated it was limited to specific instances and particular aspects of a much broader marketplace.

He estimated IBM holds between 65% and 75% of the market and Honeywell, 8% to 10% since its merger with General Electric.

Banks Save 75% in Development Of Cooperative Audit Program

KANSAS CITY, Kan. – A group of banks here got together recently to resolve a mutual problem involving auditing requirements – and each saved 75% on its program development.

The problem was how to get programs written to audit the banks' computer files as required, at a minimum cost and without using the banks' programmers.

The group contacted a local software company and negotiated the production of audit programs, specified by the bank group, on a shared-cost basis.

The banks, Security National Bank of Kansas City, Kansas City Bank & Trust Co., Goppert Banks and Douglas County State Bank of Lawrence, all have NCR computers ranging from Century 50s to Century 200s.

Centaur Systems was able to provide one program which could service all the machines. There were some minor problems with the variety of disk units but nothing major, since Century software and files are almost universal, W.R. Hill of Centaur said. The most amazing part of the project is that the banks could get together to do it, Hill said. "Banks aren't usually that cooperative."

Oregon Kills Tough Privacy Law

(Continued from Page 1)

court. Oregon newspaper publishers were considering bringing suit.

Gov. Robert W. Straub decided the quickest way to deal with the situation would be to call a special session of the legislature. Three days after the law became effective, it was killed.

Bill Expected Again

Known as the "rap sheet" bill, it or a revised version is expected to come up again at the legislature's next session. Legislators will be much more careful in finding out exactly what such a bill entails before passing it, according to Stevie Remington, executive director of the American Civil Liberties Union of Oregon.

Remington said that such a law is necessary because employers look at an arrest record the same way they look at a conviction record.

Jim Durham, a lawyer at the attorney general's office, said that office's position is that all records should be open to everyone for whatever reason.

"Privacy is a kick people are on now," he said.

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Next, we asked three computer installations in the East, Midwest and West to provide the "tracks." They were to choose the files to be run and make the evaluation of the results. No hanky-panky. At one center, all four sorts were put through their paces under exactly the same conditions. At the other two places, SyncSort was matched against the IBM sorts.

Finally, we did something that's never been done before on the playing fields of sorting. We brought in a hardware monitor to judge the events.

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Tries to Add Uptime Often Not Worth Cost

(Continued from Page 1)

When many systems share the operation of a host CPU, any system can cause the host to crash for all systems, he noted.

Closely related to uptime is response time to the terminal. The system could degrade to the point at which poor response may be equivalent to a partial hardware or software failure.

Typical response times vary from 3 sec on minicomputer-based networks to 7 sec on large host interactive nets, Hill said.

Quick Pinpointing

When network outages do occur, the faster a communications manager can pinpoint the problem, the shorter the outage will be, according to Dexter Wallis, supervisor of data communications at Fluor Corp.

In many cases the communications manager will have to spend some money on acquiring test equipment, but the amount of this equipment is directly proportional to his knowledge of what is happening in the network.

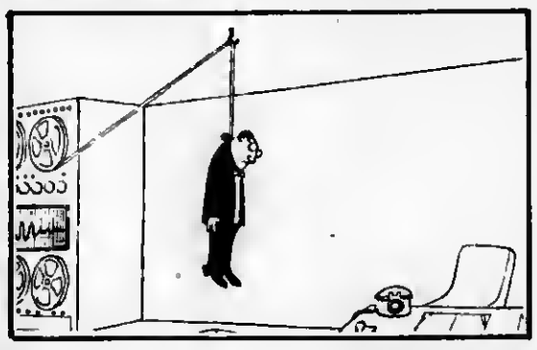
One of the simplest pieces of test gear is a level meter and fixed-frequency signal source which costs about $200, but this can pinpoint about 60% of the analog problems that occur in a network, Wallis said.

In the more costly category, test equipment is now available that will display the bit patterns within the control characters of a transmitted block of data.

This type of unit costs about $8,000, but it allows the communications manager to monitor (for the first time) the characteristics of the teleprocessing software in his network, Wallis said. Even the programmers rarely know whether the software structure is transmitted correctly.

"The communications man has to tie all of the operational requirements, hardware and software together. It is up to him to detect the cause for software protocol errors and delayed responses.

"It is also up to him to detect if the errors are caused by computer software, hardware, lines or terminals," Hill told the attendees.



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HEW Agency Consolidation Tactic Sparks Concern on Capital Hill

(Continued from Page 1)

Centralizing the privacy law's implementation under the HEW secretary's authority means exemptions for any information system within HEW must be approved by the top man.

If appeal by a member of the public is turned down by an individual agency, for example, the secretary can reconsider that appeal, he said.

Members of the House Government Operations Subcommittee on Government Information and Individual Rights have decided to wait and see how things "shake down."

If necessary, oversight hearings could be called or an amendment written, but no subcommittee member would say that is necessary now.

A spokeswoman for the American Civil Liberties Union (ACLU) agreed.

"This is an example of a problem that can come up when a law is open to very broad interpretation," Trudy Hayden, editor of ACLU's *Privacy Report*, said.

"We're not saying this is necessarily an abuse of the law, but it should be noted on a list of potential problems. Undoubtedly, within a few years, there will be a long list of things that will have to be amended," she said.

Some federal officials predicted conflicts would arise between the Freedom of Information and Privacy Acts as early as last January, and this summer the Justice Department was called upon to help clarify the problems, a spokesman from the Office of Management and Budget said.

In a memo by its general counsel, the Justice Department said the word "agency" can mean not only different things to different agencies, but also different things for different purposes within the Privacy Act.

It might be 11 different agencies for appeals procedures, but only one agency for purposes of interagency transfer of personal data, the spokesman noted.

However, the Justice Department memo also said agencies "should not define the term 'agency' with the intent to undermine the purposes of the Privacy Act."

To date, Washington observers who are perusing the various agencies' and departments' guidelines published in the *Federal Register* indicate HEW is the only one to employ this strategy.

Commission Eyeing Reservations

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – What hotels and airlines actually do with their reservations information will be one of the first topics to come under scrutiny by the Privacy Protection Study Commission, the seven-member group decided here recently.

Three other studies will be conducted simultaneously, and findings will be published by Dec. 31. Those inquiries will focus on:

- Use of the Social Security number as a universal identifier.
- Information-sharing practices between states and between states and the Federal government.
- The individual's right to get his name removed from mailing lists.

Although the commission is being courted by representatives of various think tanks, the first four projects will be researched and the reports written by the commission's own staff, a spokesman said.

Data will be gathered through hearings and from the oral and written commentary of experts.

All topics slated for inquiry were mandated by the Privacy Act of 1974, the spokesman said, and at least one, the airline and hotel reservations data study, was an easy subject to start on as a learning exercise.

"It is a boundable problem rather than one that threads all through society and, in studying it, one need deal with only a limited number of organizations," Willis Ware explained. Ware is vice-chairman of the commission, which was established by the act.

"It may well turn out reservations systems are as clean as they come, but I would like to see them documented and in the public eye," Ware said.

Ford Urges Privacy From 'Big Brother'

PALO ALTO, Calif. – Government agencies are legally gathering vast amounts of computerized information on American citizens that is both "excessive and intrusive," President Gerald Ford said at a dedication recently at Stanford University Law School here.

Ford, who declared "we must protect every individual from . . . a 'Big Brother' bureaucracy," admitted "one of the worst offenders is the Federal Government itself."

Ford noted he was not talking about wiretapping or other "improper or illegal invasions of people's privacy or constitutional rights by federal agencies or individual officials."

The threats he had in mind were those that resulted from laws "enacted by Congress for laudable purposes."

These laws encourage government agencies to collect data about such things as the health and behavior of citizens for such programs as welfare, Social Security payments or other special assistance programs.

The government has found legitimate reasons for gathering information on students seeking scholarships, professors looking for grants and business seeking loans, for example.

"The list is endless," Ford said.

Advances in computer technology have permitted the collection and consolidation of greater and greater amounts of data that is retrievable "by anyone trained to push the right buttons," he said.

The Privacy Act of 1974, which went into effect Saturday, Sept. 27, will help, Ford claimed.

"I see the great challenge of our next hundred years as the advancement of individual independence . . . of specific steps to safeguard the identity of each and every American from the pressures of conformity," he said.

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During PRINTCOM analysis, we input as many as 300 of your cost variables into a PRINTCOM terminal and get back a detailed financial analysis of your immediate savings and of your long-term savings potential.

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Beyond PRINTCOM, Kodak is putting a great deal of effort into COM research. Some of this effort and investment has already paid off in technological improvements and versatile software programs Kodak can provide to its users.

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Kodak KOM-80 microfilmer. For top throughput speed with high reliability

For a low $2495, Digital's VT55 Graphics Terminal reaches new heights.

Digital announces the VT55 Graphics Terminal. For use with anyone's computer. To handle a variety of applications more productively through the addition of graphics capability. With optional hard copy output. At a unit price as low as $2495.

Use the VT55 for plotting histograms, waveform and peak analyses, data acquisition, monitoring, trending, simulation, laboratory charts and forms, or wherever your applications can be improved through graphics.

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A full keyboard offers the complete ASCII character set displayable in as many as 24, 80-character lines.

Terminal-to-computer communications speeds are variable up to a fast 960 characters per second.

The $2495 graphics terminal from Digital. A new high for video display capability at a new low for graphics cost.

Write for our new brochure. LDP Graphics Group MR2-4/E14, Digital Equipment Corporation, 200 Forest Street, Marlboro, MA 01752. (617) 481-9511, Ext. 6933. European headquarters: 81 route de l'Aire, 1211 Geneva 26. Tel: 42 79 50. Digital Equipment of Canada, Ltd.

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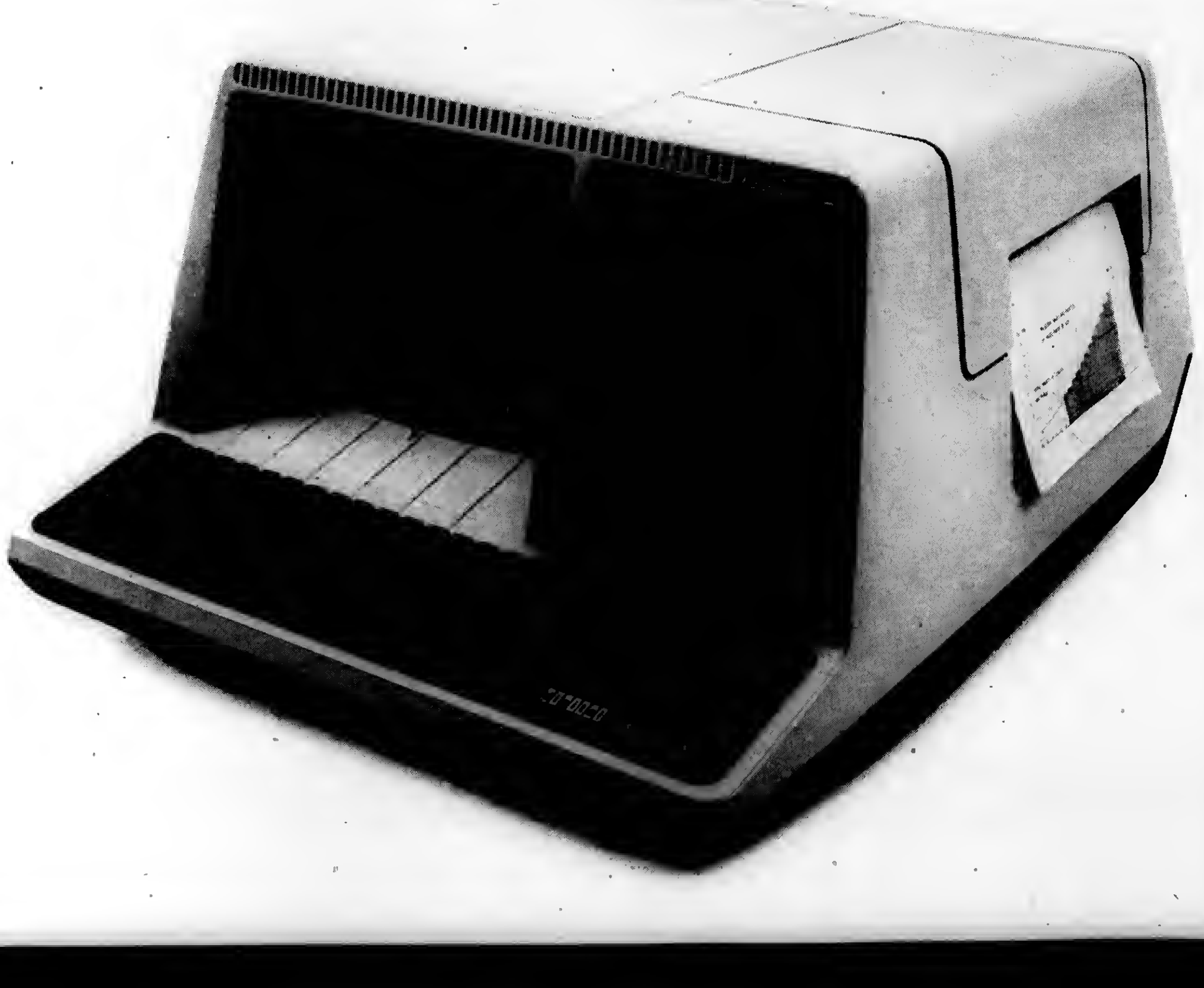
Company _____

Address _____

City _____

State _____ Zip _____

Telephone _____



IBM Told to Shun PCM

(Continued from Page 1)

age development time at prices ranging from $250,000 to $2 million.

The IBM document then went on to say there was no discernable market for peripherals sold for non-IBM systems.

Meanwhile, the Supreme Court reconvenes this week and is expected to make its decision shortly on whether to hear Telex's appeal of the reversal of the district court verdict.

Then Telex also has a number of other alternatives. The firm can try to establish a violation of the rules of discovery by IBM because it did not release the document before the trial.

Telex can then seek either a new hearing at the court of appeals level or even a new trial, either at the district or appeals court level.

Reactions of Competitors

In the report IBM considered just how its mainframe competition would react. The study estimated that in 1977 competing manufacturers would have 21,258 systems in the field into which it could plug its compatible peripherals.

It estimated about 225,000 devices would be involved and that it could take about 25% of that market.

Reasons against IBM's entering the business, detailed in the document, included:

- It would encourage the business of system integrators and facilities management firms.
- It would force more standardization – IBM products would tend to become less exclusive.
- It would open wider gates to PCM on IBM systems, including the competitive plug-compatible CPUs.
- It would open wider competition for peripherals.
- It would increase the requirement for short product life cycles.
- It would encourage industry standards with a possible impact on design flexibility and innovation.

Reaction Predicted

IBM also predicted its mainframe competition would react in two basic ways: "Larger more established companies, especially those that would manufacture their own peripherals, would compete vigorously.

"They would cut prices on peripherals, change interfaces, bundle hardware, avoid releasing interface data, lock software (may charge IBM a fee), increase maintenance prices on the CPU, exclude all foreign equipment of rental systems and accelerate the introduction of a line of 370-compatible CPUs for attachment to IBM peripheral subsystems in their accounts and IBM accounts.

"The smaller, less-established and new companies would cooperate with IBM and accept the IBM peripheral subsystem as *the* subsystem for their own machines . . . and these companies would then concentrate their resources on the development of a CPU with very advanced architecture.

Interface Development

In reference to the development of interfaces, the study went on to say "[IBM] must have interface data for competitive systems (design and timing information). This data is not 'reasonably' available as there are no OEM manuals . . . past experience on [requests for price quotations] has shown that 'engineer-to-engineer' meetings are required to disclose [interface] information."

The study added there "was no standard interface within competitive systems – everything is unique.

"Interface changes in hardware and software by the competitor," the report continued, "provides a moving target as a design specification."

Telex Asks Judge to Lift Stay

OKLAHOMA CITY, Okla. – Telex Corp., armed with the recently acquired IBM documents, has asked Judge A. Sherman Christensen to remove the stay on the Telex vs. IBM case concerning competition outside the U.S.

The documents were among those "that should have been given to Telex prior to its trial" in its appeal against IBM on domestic competition, Floyd Walker, Telex attorney, said.

Work on the foreign issues case has been frozen since April 1973 by a stay awaiting final decision on the domestic appeal, Walker said.

Telex is asking for the stay to be removed to allow additional discovery to determine why the documents were not given to it previously, he said.

Hot dog.

A Honeywell minicomputer helps a meat packer.

A well-known meat packer has built a real time warehouse data acquisition and control system around a Honeywell minicomputer, giving him:

- up-to-the-minute inventory status
- logging and verification of shipments received
- a record of actual shipments compared with orders
- automatic collection and transmission to central computer

What can a Honeywell minicomputer do for your operation? Let's talk.

NAME _____

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ADDRESS _____

CITY _____ STATE _____ ZIP _____

The Other Computer Company: Honeywell

Honeywell Information Systems, 200 Smith Street (MS 440), Waltham, Massachusetts 02154

$

Honeywell minicomputers are helping the banking business.

A large bank uses Honeywell minicomputers at three locations to:

- transmit MICR-encoded documents to a central processing location
- receive accounting reports at remote locations from the central computer

What can a Honeywell minicomputer do for your operation? Let's talk.

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If you rent a system 370, we can purchase it and lease it back to you at considerable savings on a short-term operating lease. Just send us your installed configuration with purchase quotations.

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Users Seen in Transition To Data Base Orientation

By Patrick Ward
By the CW Staff

NEW YORK – DP users are in transition from a batch-oriented DP technology that provides periodic status reports to a decentralized, data base-oriented technology in which the telephone is the most important terminal, a Univac senior staff consultant said here recently.

Dr. George A. Champine traced the development of the computer from its start as a replacement for clerical labor to a management tool that can answer "what-if" questions.

Manufacturing firms, for example, typically began by using computers to handle accounts payable and receivable, billing, sales analysis, financial reports, stock status reporting and other tasks, Champine said at a conference here recently.

As users grew in sophistication, they applied their DP resources to job cost and scrap analysis, bill of materials, inventory control, budget preparation, maintenance scheduling and other "what-if" applications.

As the industrial users became advanced, they tended to go into numerical control, material handling, tool utilization, scheduling, routing and other more sophisticated applications, Champine said.

At the next level of DP use, industrial firms went more heavily into such usages as design and engineering, industry and market forecasting, pricing, simulation and so on, he said.

This sort of DP use helped management function as a control system by gathering data, summarizing it in reports and identifying the variances from what had been planned, he said.

The kind of technology described here was based on batch processing and periodic, hard-copy status reports. It used special-purpose terminals and preprogrammed, special-purpose software in Cobol or Fortran.

The hardware was localized; there were separate files for each application, and experts interfaced end users to the system.

The management consequences of this approach were that it prevented management by exception and produced too much paper, Champine said.

'Transition Technology'

The "transition technology" users are now resorting to offers terminal input/output and batch-processed updates; Champine said.

Also present are generalized data management systems, remote batch, leased communications lines and redundant centralized systems, he added.

With the move to heavy, online use, reliability becomes crucial. Redundant, fail-soft technology will become more and more of a trend with fourth-generation technology, he said.

Among the economic factors in this transition stage are falling hardware costs. Champine predicted "everyone" will offer 400M byte/spindle disk drives 18 months from now, and 1,000M byte/spindle disk drives will follow. Mass storage costs will be down by a factor of three or four by the end of the decade, he added.

At about that time, "future technology" will offer some systems in which no programming is necessary, he said.

Among the management consequences will be management by exception and reports on demand.

Simulation Preference Models Help Developers Plan Effective Land Use

MADISON, Wis. – How can the land-use planner help real estate developers make the most effective use of undeveloped areas?

Answers to this question are being approached through computer simulation preference models by James Moore, professor of landscape architecture here at the University of Wisconsin.

The models help explore the process of decision making and predict the outcome of the trade-offs made by people in deciding where to live or where to place a business.

"We just don't have a good way to anticipate reaction to innovations in land use," whether they are for new housing, businesses or public structures, the land development specialist said.

Moore's research on the effective use of undeveloped land involves extensive inquiry into this decision-making process.

He begins with an individual model – couples thinking of buying a house, for example – and learns what trade-offs they make in their final choice.

The individual consumer decision is the least complex but, even so, "we have to simulate a housing market and deal with husbands' and wives' arguments, which is a pretty wild thing to do," he remarked.

The simulation model allows the rating and ranking of hypothetical homesites from a 30-criteria preference sheet filled out by the couples.

Predictions made from the model by the university's Univac 1108 system were more than 80% accurate in a 50-couple sample, Moore said.

System Picking Crowd To Welcome Hirohito

HONOLULU – Mayor Frank Fasi is turning to a computer to make sure some "plain folks" will be on hand to greet Japan's Emperor Hirohito and his wife when they visit Hawaii this month.

A crowd of 2,000 will be selected by computer from the list of the city's registered voters to assure the emperor and empress will "see and be seen by a cross section of our population," Fasi said.

Charge it.

Honeywell minicomputers help make credit checks.

A company uses Honeywell minicomputers to provide credit card and check authorization services for clients like department stores, discount houses, supermarket chains and nightclubs. The minicomputer system:

- maintains a file on over three million client accounts
- receives inquiries from 3,500 touch-tone telephones in 285 locations throughout the U.S.
- replies via voice-answer-back within three seconds
- records all inquiries for client auditing and billing of services

What can a Honeywell minicomputer do for your operation? Let's talk.

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The Other Computer Company:
Honeywell

Honeywell Information Systems, 200 Smith Street (MS 440), Waltham, Massachusetts 02154

Bugs.

Honeywell minicomputers help keep defects out of new cars.

A major automobile manufacturer uses Honeywell minicomputers for a real time vehicle assembly quality reporting system. Defects found at inspection points are fed directly into the computer resulting in:

- up-to-date defect reports via CRTs at assembly points
- early spotting of trends
- reduced factory rework cost and fewer warranty repairs
- emergency backup for large dual host processors that schedule operations and parts deliveries

What can a Honeywell minicomputer do for your operation? Let's talk.

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Editorial

A Sad Commentary

It now appears Congress left a loophole big enough to drive a truck through when it drafted the Privacy Act of 1974.

And the Department of Health, Education and Welfare (HEW) has found that loophole and is behind the wheel, ramming its way through this opening in the law.

The problem lies in the seemingly innocuous definition of the term "agency." The Privacy Act gave the term the broadest statutory meaning.

According to the Office of Management and Budget's guidelines, an agency is "any executive department, military department, government corporation, government-controlled corporation or other establishment in the executive branch, including the Executive Office of the President or any independent regulatory agency."

In its implementation guidelines, HEW – with 11 agencies, 130,000 employees and control of one-third of the federal budget – has chosen to define itself as *one agency* [CW, Sept. 24]. This move effectively exempts the entire department from the Privacy Act's requirements to:

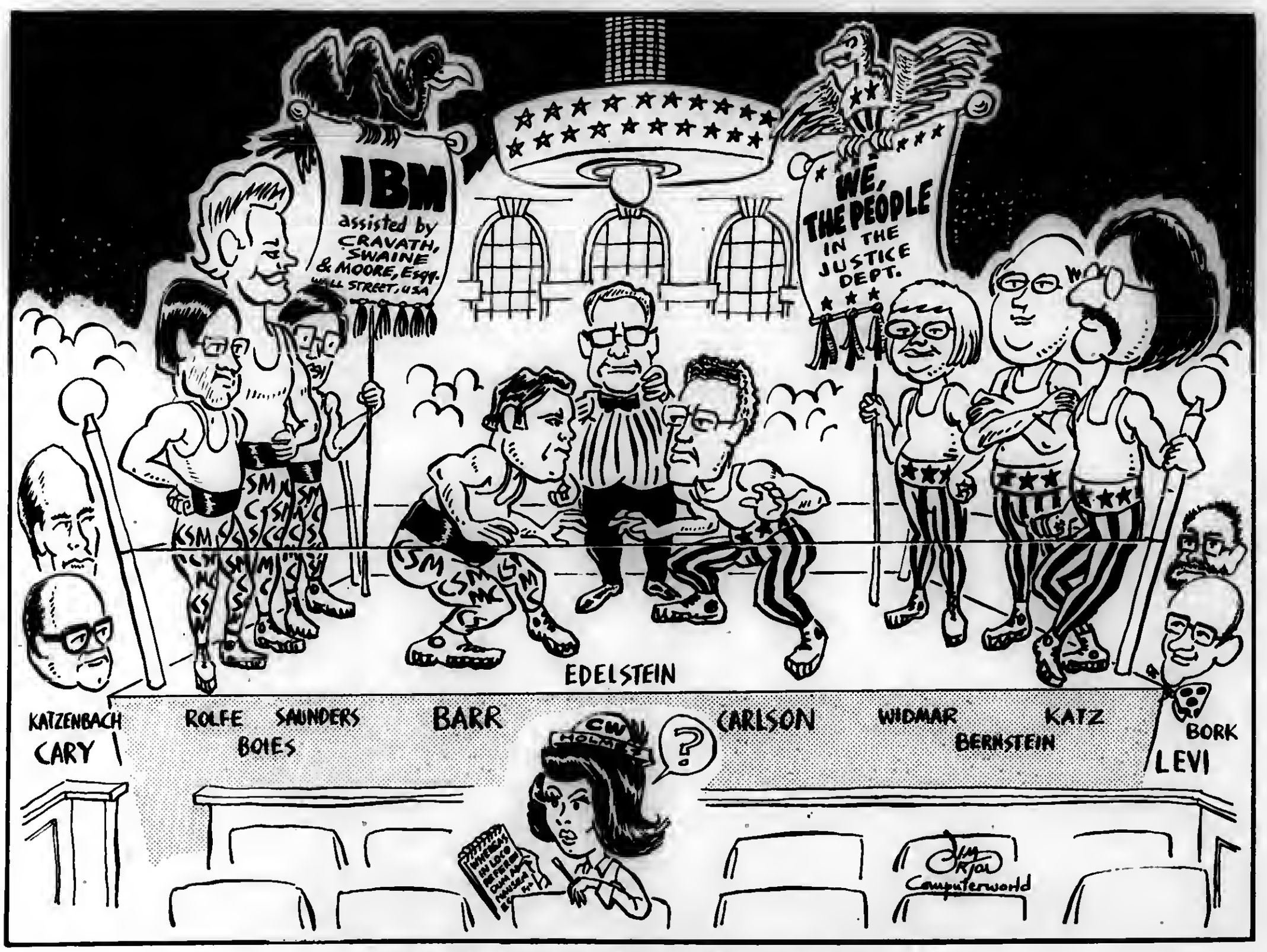
- Keep records of disclosures between agencies. Exchanges between the Social Security Administration and the Office of Education, for example, would not have to be recorded because the two are part of the same "agency."
- Make available those disclosure records to the individuals named in them and allowed by the law to examine them. If no records are kept of disclosures within HEW, however, individuals will not be aware their records were shared.
- Inform agencies about any corrections or disputed information in records they may have received. Again, if no records of disclosures within HEW exist, to whom could these corrections be sent?

Ironically, it is HEW – under whose auspices the original recommendations on the management of automated personal data systems were made – that is making a virtual mockery of the law.

As matters stand, HEW will allow agencies having such vastly different statutory authority as the Office of Education, the Public Health Service, the Social and Rehabilitation Service and the Social Security Administration to continue to share information for purposes other than that for which it was collected – at its own discretion.

But this case may be only the tip of the iceberg. As congressional oversight committees begin to plow through the foot-thick implementation documents published by the various other "agencies," more problems are bound to surface.

(Letters to the Editor on Pages 11 and 12.)



The Battle of This Century (And Possibly the Next?)

Letters to the Editor

Use Macro Identifier On Indexed Labels

In the past, some readers have complained about the indexed labels generated by certain macro instructions. This may be due to the lack of information contained in those indexed labels which have a standard, unvarying prefix.

The information content in an indexed label can be greatly improved by using a prefix that identifies the macro instruction. This will allow anyone to identify the macro instructions used and their locations from a cross-reference listing. If the first character is carefully chosen, these indexed labels will be collected apart from the others used.

R.A. Sobieraj
Perth Amboy, N.J.

Wall Street Qualified To Name Survivors

In the article predicting survivors in the mainframe arena, the New York Stock Exchange firm of Shearson Hayden Stone, Inc. (SHS) predicted that only IBM and Burroughs Corp. would survive [CW, Aug. 13].

Wall Street should be as well qualified as anyone to select firms to drop out because profits are too low – Wall Street is littered with the bodies of member firms that have folded.

SHS is an example of a shotgun marriage of two such brokerage firms. How can such losers tell us anything?

Bryan Dietz
Minneapolis, Minn.

Congratulations, CW

I want to congratulate *Computerworld* on the recent article, "View from Below Shows Manager Should Leave His Quirks Home," by Robert Powers [CW, Sept. 10].

I was particularly pleased with the chart of composite management categories and suggest this be used as the basis for a rating form on management performance.

Esther Rosenstock
Lefrak City, N.Y.

Aid to Cost-Conscious

Regarding the issue of stamping prices on individual items, why not develop a register which prepares a tape containing quantity, alpha description, net weight, total cost and unit cost information?

Such an item would minimize supermarket labor and would provide a valuable service for the cost-conscious shopper.

Willis H. Sargent
New York, N.Y.

Sunnyvale

A year or so ago, when my house lease expired out in the Boston suburbs, I talked to my boss Pat McGovern, publisher of *Computerworld* about a new location. One possibility was Manhattan, warts and all; the attraction was primarily the headquarters operation of the Association for Computing Machinery (ACM), of which I had just been elected an officer. Another was Europe, where Pat was finalizing plans for *Computerwoche*.

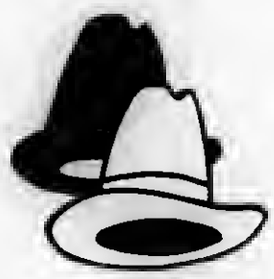
In the end, we decided I should stay near home base for one more year, and I came into an apartment in Back Bay. That lease too is up, and the movers came yesterday!

ACM is doing just fine, and our German sister paper has been born (and frequently carries Black Hat/White Hat, in the original, ah, English). So I'm going to relocate to the West Coast and spread the *Computerworld* net a little wider. My wife Nancy is already at work at a computer service operation in Santa Clara, so we found a town house nearby in Sunnyvale, and I'll work from there.

I'll remain an editor of *Computerworld*, but "editorial director," pleasantly though the words ring, would be an exaggeration. I hope to find an academic connection to replace the small one I had at Boston University. And I'll consult for International Data Corp., CW and for outside organizations also.

I hope readers will continue to send letters and other material, although time-sensitive press releases had best be directed to the editorial offices in Newton. My new address will be 1383 Zurich Terrace, Sunnyvale, Calif. 94087. I'm particularly anxious to act as a focus for both northern and southern California computer happenings as we are often unable to cover press conferences or announcements out there because of the expensive distance from Boston to the Pacific. For major events, a *real* reporter or editor is of course dispatched, but I can blow the occasional whistle. And provide detailed coverage of the better parties – *viva* DCA!

New England is enormously stimulating, and I have valued the opportunity to work on the privacy scene in Massachusetts. But California has always been Computerland to me; I hope my visa is still in order!



Herb Grosch

Suspicious DP Outputs Demand Auditor's Attention

Recently a senior IBM executive launched a strong attack on internal auditors with regard to their alleged "perfect" record of failing to find cases of computer-related fraud in 1973 and 1974, when plenty of such cases were occurring.

The attack came from IBM's manager of security, Robert Courtney, who said the internal auditors had played no part in any of the 600-odd cases that had occurred during the period, even though the average amount of money (in the 1974 period) involved was $554,000.

The Taylor Report
By
Alan Taylor, CDP



Certainly, with frauds of this magnitude coming up practically daily, some attention has to be paid to the matter. Unfortunately, Courtney did not consider the question of whether the internal auditors had any way of finding out about the frauds, preferring to hold them up to ridicule before the Data Processing Management Association (DPMA) national convention this summer.

In fact, if he had considered this question, he might have pointed out to his audience the importance of analyzing what have been referred to as "hot spots" in this column over the past few months. Hot spots, in this context, are areas of poor systems design which cause problems with public relations, customers, etc., while not stopping the system in any way.

Zero-Balance Dunning

Some of the hot spots that were discussed involved inflexible credit card numbers, unchecked digits on overdrawn credit accounts, too-flexible airline reservation systems with unnotified cancellations, etc.

Another example of such a hot spot to be discussed this week is the case of the dunning demand for a balance of zero, an instance of arrogance that has been occurring now for well over 13 years and which continues to occur with monotonous regularity. This problem is one which the DPMA audience probably had never considered in relation to the question of security.

St. Joseph Mercy Hospital in Ann Arbor, Mich., which issued the zero-balance dunning message to a reader, Suresh Bazaj, is a substantial financial operation. It has 550 beds, and anyone who knows anything about hospital costs will realize an average computer fraud is certainly not to be ruled out with this amount of money hanging around.

However, any connection between such a fraud potential and the billing arrogance of zero-balancing dunning seems – on the surface – to be ridiculous. After all, the system did not ask Bazaj to pay any unjustified amounts, so where is the fraud connection?

Below the Surface

However, an internal auditor is expected to look below the surface. Here the situation is very different. After all, what the statement said offers no real evidence of what the hospital records said about Bazaj.

Even what is reported on the hospital terminals need not reflect the full, computer-stored records – a fact every internal auditor should remember.

An embezzler, moreover, has more things to be concerned about than getting the false checks printed or whatever his method is of obtaining the cash. He also has the task of keeping the books balanced to evade routine detection. And balancing the books implies being able to falsify them as needed.

With such serious computer frauds occurring daily – even though they may not often be reported to the proper authorities – internal and external auditors, DPers and managers should certainly investigate any circumstances that suggests records could be falsified, even though no actual falsification is currently being done.

The nature of falsification potential resulting from the St. Joseph zero-balancing dunning can be seen by simply reversing the standard computer explanation, that is, that it is a program mistake in the selection of the message.

Instead, look at what the consequences would be if one assumes the dunning message is correct – and the zero balance on the statement is where the mistake actually is.

The dunning message indicates:

- There is a positive "payable by patient" amount recorded as being due from Bazaj, even though he owes the hospital nothing.
- There has been at least one month since he received service (which is correct, since the statement date was July 31, and service was received June 14).

If the real amount due is not what is on the statement, then the hospital's accounts receivable figures are being inflated, even while Bazaj is not being asked to pay any more.

To determine which of the two possibilities is really correct requires investigation, of course. However, the internal auditor could find some clues on the statement itself. For instance, there is the statement, "If there is a balance shown in the "payable by patient" column below, a payment card has been enclosed."

Such a statement gives the auditor a way to check whether he is dealing with a dunning message flag or a suppressed balance. A dunning message error would not initiate the enclosing of a payment card, while a suppressed-balance situation might very well trigger a payment card. Bazaj received a payment card with this zero-balancing bill, in an apparent confirmation that something was in the patient balance field that was not being printed.

In fact, there is yet a third suspicious circumstance hinted at on the statement. The St. Joseph Mercy Hospital system apparently invites an embezzler to use some differences between the statement given to a patient and the hospital record as an almost undetectable way of fraud.

The form itself reads: "We are enclosing an extra copy of this statement for your convenience. We will be unable to provide any additional copies." And, sure enough, Orville Somers, the hospital's director of information systems, had to ask me for details about what was on the statement after he had investigated the matter for me.

Enough Information

All in all, there is quite enough information available in such hot spots to start internal auditors questioning and to give them justification for doing so. Yet I doubt whether many, if any, internal auditors or external auditors would ever investigate a wrongly placed 60-day dunning message.

After all, everyone knows computers make mistakes. Particularly when a tape drive breaks down while an Autocoder and Cobol mixture is being run on a Model 40 during the unification of two systems (which was what happened at the hospital).

So perhaps the IBMer's attack on the auditing profession was at least partly justified.

By the way, nothing in this article should be taken as suggesting any actual embezzlement or record falsification is taking place at St. Joseph Mercy Hospital. The comments on its billing system are simply to show there are methods available which permit internal auditors to initiate appropriate investigations.

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Letters to the Editor

Nothing Embarrassing About IBM's Riches

Other than to express an obvious dislike for IBM, one wonders what the purpose was of George Warren's commentary "IBM Attempting to Diminish Embarrassing Cash Hoard," [CW, Sept. 17].

Warren selected figures from IBM's 1974 annual reports and surrounded them with innuendoes in an effort to convince us there is something tainted about the firm's financial structure. He would have us believe IBM has vaults full of gold doubloons and pieces of eight.

Everyone knows that Fortune 500 company IBM is big, big, big. Of the thousands of banks in the country, over 90% have total assets less than $1 billion. It's intuitive that IBM's "cash hoard" would be larger than most banks.

A ratio of 30% of cash to total assets is not unusually high; it represents planned liquidity and financial stability. A return on investment of 8% for investment securities for 1974 was not high for the period.

Perhaps management did anticipate payment of judgments or possible restructuring, recognize the growth of lessors and other vendors, plan for future acquisitions, or decide to shift from a growth stock to one more dividend-oriented. Whatever the reason, there is nothing embarrassing about liquidity.

Paul R. Lee
Memphis, Tenn.



Vive La Difference—Sex Bias No Disgrace

After all these nice letters in response to my letter of Aug. 20, I think it necessary to explain my point of view a bit further.

Unfortunately, it is a fact that not all men are created equal; thereby killing an all-American dream, of course.

Nobody denies all should be given equal education, equal opportunity, equal rights. But, in spite of all this, certain groups are more endowed than others for a given task.

In DP, men will still wind up in first place more often than women at the rate of 9:1. This meaning survival of the fittest, who is then to blame a staff manager for having a 9:1 bias against women?

Neither Women's Liberation nor progressive legislation can do anything about this.

Mind you, true discrimination is no disgrace and means "to each his own." Females have other qualifications in which they perform much better than men, thank heaven. Vive la difference.

Thomas Mooshammer
Berlin, Germany

Taylor Topic Untimely

My deepest appreciation goes to Alan Taylor for his "timely" topic on the Darmstadt check-digit method in his Sept. 17 column.

I haven't seen that new and innovative method discussed since we used it to assign check digits to savings account numbers in 1960.

I wonder if Taylor could now please tell me where I could get a good 602A calculating punch to generate me some check digits?

David O. Cantrall
Springfield, Ill.

Article Too Emotional

I have two criticisms of the article, "Users Who Ended Contracts Say Honeywell Tried to Take Specs" [CW, Sept. 10]:

- The content of the article was highly emotional.
- The article dealt with vendor maintenance responsibilities, which are subject to individual contractual interpretation, and did not present the vendor's interpretation of a highly technical area, except for a brief explanation at the end of the article.

The interjection of highly emotional subjects in a nationwide technical publication offers no service to the readers.

The individual communications presented were of no material issue to the problem in the article. As a result, the article gave the reader the impression Honeywell was an unworthy vendor when perhaps the customer was at fault.

If the purpose of the article was to question the vendor responsibilities with regard to maintenance support of hardware, then the article should have discussed current practices that exist with all vendors.

If the maintenance responsibilities of a vendor have been canceled, it seems a customer would no longer require the vendor to maintain current logic charts and wiring diagrams. Such documents would be worthless unless current.

This article, in my opinion, has done a great disservice to Honeywell. Perhaps the article accurately depicted the approach that company had with this vendor. If so, Honeywell should be criticized, but not in the form *Computerworld* has chosen.

The article has not improved my technical or professional knowledge as a DP manager, nor has it really stated the factors in the case in a manner which can be evaluated.

Gerald L. Bortle
Oklahoma City, Okla.

470V/6 Costs Less

Amdahl Corp. thanks *Computerworld* for its report of the Amdahl 470V/6 currently under test at the University of Michigan, which appeared on the front page of the Sept. 10 issue. I found the article factual and positive.

I would like to take exception to one point in the article. It is highly unlikely an IBM 370/168 Model 1 would be less expensive than an Amdahl 470V/6, and we know of no Model 3 168 configuration which is less expensive than our 470.

Direct comparisons are difficult, since 16 channels, a 16K high-speed buffer and high-speed multiply feature are all standard on the 470; even so, a 370/168 user could reasonably expect to pay less for the 470V/6 than for his currently installed 168.

Kenneth W. Simonds
Director of Market Operations
Amdahl Corp.
Sunnyvale, Calif.

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IMS Works for University After DBMS 'Rules' Bent

By Don Leavitt
Of the CW Staff

ANN ARBOR, Mich. – Sometimes the "rules" that seem to be growing up around data base management systems (DBMS) have to be broken – or at least bent – to have a successful installation.

That appears to be one of the lessons learned during an IBM IMS implementation effort at the University of Michigan, according to Greg Shaw, the administrative data center's manager of systems programming.

The university acquired IMS about three years ago with a good idea of why a DBMS might be useful, but without any substantial effort to evaluate the range of DBMS that were even then on the market.

"We were interested in the university providing some integrated information for management and the facilities to allow the users to get at this base of information directly," Shaw explained.

But he didn't run any comparison tests or anything like that before choosing IMS as the vehicle the university would use. He looked at some of the other choices, but decided the university had been getting good support from IBM and might as well stick with that vendor.

One of the things most important to Shaw was to have a system that would support terminals as well as the data base itself and that, in his view, limited the options open to him and led directly to the IMS selection.

In-House Training

Once the DBMS was installed on the center's 370/155 – upgraded just this summer to a 158 – Shaw tried to do a little in-house training and organized his crew to find out what information should be in the data base. The training consisted of "getting a couple of people who knew IMS" to run some classes.

Other than that, "we organized a task force of about four senior systems analysts to work with the user departments in identifying the information we needed to support their offices. We wanted to design that first data base around the offices and the functions they were performing."

No decision had been made at that stage as to which specific application should be the first installed in a DBMS environment, but the center staff had "pretty much decided" it would go with student-related development first. The press of both regular and ad hoc reports seemed to focus on student enrollments and the like.

"By inputting this information, we thought we'd get the best payoff at the earliest time," Shaw said, outlining two of the best bases for any management decision.

The data center was careful of the way it started: "We didn't want to get too fancy the first six months or so. So we designed and implemented a data base for student accounting – essentially a billing function – that had a simple physical organization without a lot of logical connections or anything of that sort."

Early on, Shaw started using a data dictionary to help his programmers know what they were doing in building the data base. The center chose University Computing Corp.'s UCC Ten package which, despite the vendor's name, is not especially tailored to university needs. "We like it. It's good," the manager volunteered.

Use of a dictionary followed the classic DBMS "rules," but the university's approach to data base administration was something else again. "We have a couple of fellows designated as coordinators and they take the brunt of the problems," Shaw explained.

These coordinators – picked from among the center's senior programmers – "track things down, making sure the parts of the system are running in 'sync'" but the administration function is clearly dispersed among the senior programmers and the data center director's staff.

There is no single authority to decide on changes in the data base. The staff members are divided along application lines and within their own areas; application programmers are encouraged to develop their own fields, their own data base designs.

Coordination of these separate designs takes place in weekly meetings between programmers and analysts. The meetings are scheduled for 10:00 every Friday and are chaired by one of the "coordinators."

The leader helps to keep things moving. Shaw said, "but responsibility for data base design still stands within the applica-

(Continued on Page 14)

CDC Service to Back Technology Swaps

By Edith Holmes
Of the CW Staff

MINNEAPOLIS – Users of Control Data Corp.'s Cybernet time-sharing network who have technological problems may soon be able to identify people and companies with solutions to their difficulties.

Beginning around the first of the year, CDC expects to have a service capability, Technotec, and an organization, Worldtech, to promote the transfer of concepts and techniques around the world.

These organizations will offer an interactive technology marketing service through Cybernet, according to Gerard M. Beaugonin, a CDC spokesman.

Technotec subscribers willing to market their ideas, processes, patents, know-how or expertise will write descriptions of these into the data base; other subscribers willing to do business will search the data base for solutions to their particular technological needs.

The success of the communication achieved will depend on the users themselves and not on the Technotec organization, Beaugonin stressed.

"Subscribers will pay on the order of $100 to store a message in the data bank for a year and users may retrieve it at any time for a few dollars," he added.

Those retrieving information will be charged according to the time they are on-line, based on an $80/hour rate. If they uncover a contact through the system that seems by its description to be worthwhile, a fee of $50 will be charged for the name and location of the company or individual, he explained.

Transaction Files

The service will be structured into three major transaction files, each containing specific types of information, Beaugonin said.

The Techno-Stock file will hold offers of existing technology that an individual or organization is willing to market.

The Techno-Quest file will contain descriptions of unsolved problems and opportunities for joint ventures for locating or developing technology.

The Techno-Aide file will consist of names of experts in such areas as finance, consulting, training and marketing who may be required to assist in the transfer of technology.

Beaugonin noted each unit of information in these three files will contain three segments organized to provide the most efficient method of locating a particular offer or request:

- The Descriptor – a narrative test drafted by the subscriber to the service which explains the capabilities he is offering or seeking.
- The Selector – a set of key words identified by the subscriber as being representative of the technology defined in the Descriptor.
- The Contact Information – the name, address and telephone number of the individual to contact for further inquiries and/or business arrangements.

"Technotec users search the data base by entering keywords related to the information they seek. When 'hits' or 'matches' are displayed by the system, the user may request the retrieval and printing of the pertinent Descriptors," Beaugonin explained.

Control Data Technotec, Inc. can be reached through P.O. Box 0 HQW11A, 55440.

'QCRT' Aids On-Line Programs

WALTHAM, Mass. – Setting up CRT displays for inquiries, data entry and file updates may be simpler than ever for IBM 360/370 users with the load-and-go Quick Change Real-Time (QCRT) on-line processor, according to the vendor, The Management Group, Inc. (TMG).

QCRT supports both the formatting of the displays and the logic for editing, validation and any other processing required to create the screen display or to work with the operators' responses to the display.

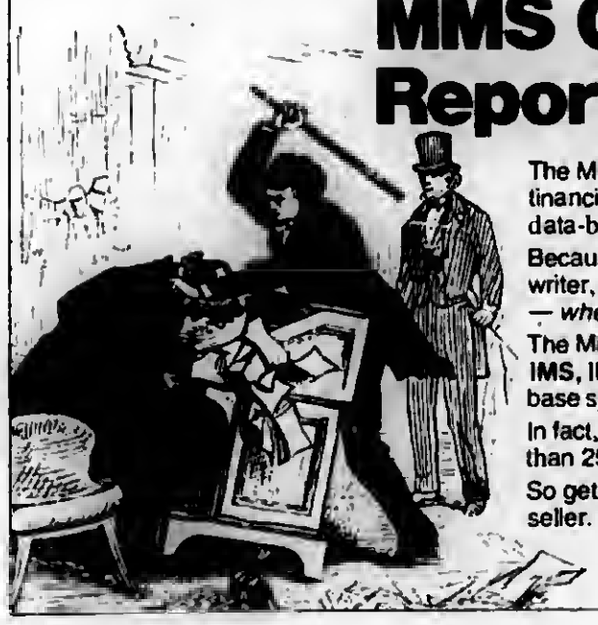
A dummy display can be put up on a screen to check format and content even before users attempt to work with the program being generated, TMG noted.

Working with a set of three highly structured coding sheets, the QCRT programmer has a parameter-driven system similar in some respects to a report generator. Unlike the older approaches, however, QCRT is fast, the vendor said. It is designed to cope with the special problems of response time, a spokesman added.

The package can work with multiple files, multiple record types, hierarchical file structures and data bases. Although a generalized data base interface isn't available, working with a particular application under Cincom Systems' Total or IBM's IMS, for example, is "straightforward," TMG said.

QCRT is written in Cobol and Assembly for IBM 360/370 equipment and requires about 50K of memory. It currently runs under IBM's Customer Information Control System (CICS), but TMG said it would adapt the on-line processor to most other communication systems without additional charge.

The package is available now for $10,000 provided use of the system is limited to one application. For unlimited use, the cost goes up to $25,000, a spokesman said from 393 Totten Pond Road, 02154.



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Ingalls Uses System 2000 for Shipbuilding Control

PASCAGOULA, Miss. – The Ingalls Shipbuilding Division of Litton Industries is building two fleets of ships for the U.S. Navy, including 30 of a new class of advanced destroyers and five general-purpose, amphibious assault ships called LHAs. Both ships are big and sophisticated.

Ingalls has total responsibility not only for the design, engineering and production of these ships, but also for the procurement, integration, testing and installation of their extensive electronic equipment; training of the Navy crews; and outfitting of the ships with all spare parts, consumables and other materials necessary to support the ships during deployment.

To assist in the reporting requirements for this large manufacturing process, Inglass Information Systems Department uses the System 2000 data base management system (DBMS) from MRI Systems Corp.

Labor Control System

Reporting of labor and material data is very critical to the total process; therefore, the Information Systems Department is first implementing a labor control system and a purchase order control system.

The labor control system provides planning and scheduling of manufacturing work packages, budgeting of those packages, validation of labor charges to them and reporting of labor-related data to management.

The data base for this system processes batch input from the Production Planning and Scheduling Control Department for scheduling data, from the Industrial Engineering Department for budgeting data and from the production crafts areas for labor charges.

These organizations are supported by technical inquiries to the data base to determine work package status. Hard-copy reporting is periodically provided to reflect manufacturing progress and any deviation from the master plan.

The purchase order control system provides comprehensive coverage of material and services procurement, receiver and invoice processing, cost assignment, inventory pricing and response to planning and scheduling.

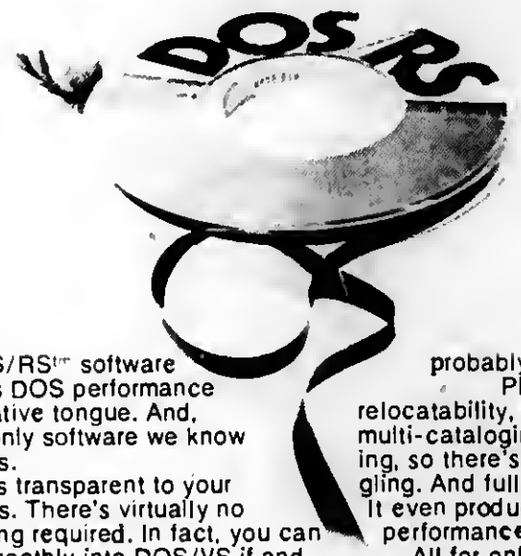
The purchase order data base contains information which may be viewed from any management level and presented in any perspective desired by the viewer.

The current data base, installed on one of the shipyard's two 2M-byte 370/158s, includes 160M bytes of information on two double-density 3330 disk packs.

The shipyard plans to continue development of new applications, and the base will shortly be increased to a billion bytes of data on five double-density 3330 spindles, according to T. Guy Smith, supervisor of systems programming.

Smith categorized the capabilities of System 2000 as good but not excellent because, although the vendor is adding multithread facilities [CW, Sept. 3], the system till now has been limited to handling just one transaction at a time.

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Implementation Effort for IMS Eased by Bending DBMS 'Rules'

(Continued from Page 13)

tions area."

The student accounting application they used as a DBMS pilot project was a good one, in Shaw's eyes, since it started from a system that had been originally written in 1969 and, even then, was expected to be an on-line system. The initial IMS effort was to replace a file update section of the old system with a data base update module.

As with so many projects, however, things didn't stay that simple. As long as they were working on the system logic, they added a whole new subsystem – for withholding of credit under specific circumstances – and did some work on student loans, too.

And that's why the effort took six to nine months, rather than the four a simple transition effort might have taken.

Since then, other elements of the hopefully all-encompassing student-related data base have been added. Latest of these additions was the installation about four months ago of an on-line registration system.

Use of this system peaks at the beginning of new semesters, reaching workloads as high as 2,500 transaction/hour coming in from 30 Texas Instrument Silent 700 and 735 teletypewriter terminals in the main registration arena. But with the university's desire to work with the students, making changes when they seem needed, some 1,200 transaction/hour are handled by this system on "regular" nonregistration days.

The application logic of the registration system checks incoming requests to be sure the student meets the requirements for the requested course.

It also has some message-switching links to other systems to ensure, for example, that a student cannot enroll for new classes if he has a serious, outstanding tuition bill.

Registration not only triggers student schedules and orderly use of the university's faculty and facilities, but the on-line system also ties positively to the student accounting system so tuition bills for the newest class loads are generated directly.

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'Bug Catcher' and 'Compressor' Improve Test Runs, Data Files

HUNTSVILLE, Ala. – Programmers apparently can debug source code more quickly and then run their programs utilizing highly compressed data files with two packages now available from General Computer Services, Inc. (GCS).

The $1,000 Bug Catcher is an Abend recovery routine designed to capture and correct data exceptions occurring during program execution.

In addition, the subroutine will notify the program in which it is residing of the occurrence of the data exception, GCS said.

The Compressor is described as a high-performance compression/decompression Callable subroutine, designed – like the Bug Catcher – for IBM 360/370 operations. Its particular value, the vendor said, lies in its ability to compress and decompress packed data fields.

Since business-oriented files typically include a large number of blanks or repetitive digits, use of any compression logic can cut sharply into the tape or disk space required. Reductions with the Compressor average 70%, the vendor claimed.

The package appears easy to use. No input data definitions are required; the routine applies what it determines to be the appropriate compression algorithm and handles all data conversions in one pass.

The Compresssor requires 1,900 bytes and is available for $5,000.

The Bug Catcher is similar to other data-exception handlers in permitting test sessions to continue even though multiple errors are identified. It differs from some others in providing an abbreviated dump format and a means of bypassing erroneous records in a production environment.

The formatted dump shows location of the problem instruction, operation code, operands, relative address of the instruction within the program, base and displacement of the operands and corrective action taken by the Bug Catcher itself.

GCS can be reached through P.O. Box 5148, 35805.

A Better 'Grasp' on VS

BURLINGAME, Calif. – DOS/VS users can get additional statistics on the operation of their systems with enhancements to Grasp/VS from Software Design, Inc. (SDI)

Grasp and the newer Grasp/VS are themselves enhancements to IBM-provided DOS and DOS/VS software.

The new functions allow the user to monitor the paging activity of each program executed and of the overall system. Paging statistics are provided in "page/hour" which are measured for each job, by partition and for the system as a whole.

Review of "pages in" and "pages out" counts, again by job and for the system, can also help the user determine a "virtual program efficiency coefficient," SDI noted, adding that, as a general rule, minimizing "page outs" will improve overall performance.

Other modifications to Grasp/VS accounting procedures provide the user with data on real storage used by each program. This includes all pages used dynamically taken from the page pool by the program and is reported by average and by maximum bytes used.

The average real-storage-used figure is described by SDI as "the first true measure of working set size known to be commercially available."

The maximum real-storage-used figure is a measure of the overall storage utilization at execution time and "should help the user to minimize storage contention in a VS environment," the vendor claimed.

Grasp/VS will also report the number of I/O operations with the amount of I/O time used by the Sysvis device.

Grasp/VS, including the updated logic, is available for $238/mo from SDI at 880 Mitten Road, 94010.

'Datacom/DC Entry' Aids Novice User

DALLAS – Datacom/DC Entry from Computer Information Management Co. (CIM) is a single-task communications control package designed for IBM 360/370 users installing initial on-line terminals.

It requires no specialized precompilers to produce on-line program modules. With the exception of the single entry limitation, it offers the basic capabilities of the firm's Datacom/DC multitasking monitor at lower cost, a spokesman said.

The Entry version is upgradable to CIM's full Datacom/DC multitasking data communications monitor as well as the Datacom/DB full data base management system as the user's volume and terminal network requirements grow, the company noted.

Local, Remote Support

Datacom/DC Entry provides both local and remote terminal support with the standard masking facilities. Only those capabilities required in high-volume advanced networks are not included in the Entry version, according to CIM.

This version of the communications controller requires 30K to 34K bytes of memory. It includes some BAL coding and is therefore limited to IBM 360/370 sites. It operates under either DOS or DOS/VS but not under OS.

Datacom/DC Entry costs $15,000 with 10 days of on-site education. Also included is a special conversion-cost saving if and when the user upgrades to the Datacom/DC communications monitor.

CIM is at 3707 Rawlins St., 75219.

RJE Concepts, Benefits Topic of Free Seminars

TOWSON, Md. – Martin Marietta Data Systems will hold free, half-day seminars on computing power through a remote job entry (RJE) terminal in Cleveland, Chicago and Philadelphia this month.

The presentations are designed to show ways of acquiring, replacing or enhancing in-house computing facilities, a spokesman said.

The seminar is scheduled in Cleveland on Oct. 15, Chicago on Oct. 22 and Philadelphia on Oct. 23. Information on times and locations is available from the firm at 300 E. Joppa Road, 21204.



"My team evaluated every Database Management system going. We picked IDMS and the choice was easy. Here's why."

William Casey

"I know exactly how you feel about choosing the right Database Management system because I've done it. You think it'll be a tough decision. We thought so too... but it wasn't.

My team (from a large insurance company) surveyed the entire field, then boiled it down to five Database Management systems and two File Management systems.

We started out completely impartial. But from the first one system kept standing out: IDMS. It offered many features that simply weren't available on other, much larger, systems, yet it had an overhead figure of only 50 K.

Its variety of data placement techniques, its unrestricted facilities for logically relating all data under its control, its provision for an unlimited number of database entry points, and its superior space management approach amounted to both a substantial performance edge and a flexible database architecture advantage.

With data independence established by means of separate schema and subschema compilers, we realized that many applications programs would no longer depend on data definitions they themselves employed.

From a programming point of view, the system was miles ahead of its competition. Example: IDMS's DML processor inserts all necessary data record descriptions directly into the user's COBOL program and allows use of database-oriented verbs, such as FIND, OBTAIN, or STORE.

We were pleased to find that IDMS is the only system currently running on IBM (OS and DOS) and Univac Spectra equipment that corresponds to the CODASYL DBTG specification of April 1971. Machine independence is always an important consideration, and IDMS represented the perfect answer to that issue.

Also, the IDMS/CULPRIT retrieval system, running from the same data definitions that the user established to create his database network, provides unlimited database access facilities for reporting purposes.

We found the documentation was beautifully done – complete and well-presented. The users we contacted were most enthusiastic about the system and confirmed what we'd heard – that the Cullinane Corporation has an outstanding reputation for support.

If you're serious about Database Management you have to look seriously at IDMS.

Write or phone for a technical brochure or call me, William Casey, and if my travel schedule permits, I'll personally show you exactly how we compared the various choices and why we picked IDMS. You see – I liked IDMS so much I joined the Cullinane Team.

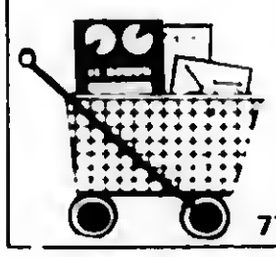
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A Modest Proposal

SR² Takes Period to Logical Extreme

By J.T. Arnold
Special to Computerworld

After implementing William B. Simmons' Structured Period Concept (SPC) [CW, Aug. 20] to use Cobol's Rudimentary Blocking Facility in my latest program, I found the technique so beneficial I carried it to its logical and extreme conclusion with a revolutionary concept of my own: the Structured Right Side Rule (SR^2).

Concepts and Techniques

Stated briefly, in its simplest and most elegant form, the SR^2 rule is: "No character may appear in any column except 12." This has allowed us to write Cobol with a right-hand side as precise and as non-ragged as the left.

A minor drawback was initially encountered in that we could not get our compiler to generate anything except diagnostics.

This was overcome, however, by writing a Cobol preprocessor that converts dedicated characters of the alphabet to Cobol division names and verbs. This was an acceptable compromise. It allowed us to visually inspect our SR^2 source code with ease.

After dedicating characters of the alphabet to our preprocessor, we discovered we had only five characters left for paragraph names and data names. This is actually beneficial, since program size is kept to just a few lines and the programmer is forced into a modular system design.

Hallowed Laws

When we first began implementing our revolutionary concept, we were somewhat dismayed to think we were losing the import of the hallowed laws of the original Codasyl committee when they constructed a language that would "read like English."

We were not deterred from such a sacrilege, however, since our technique is not much further afield than the SPC, where the period for a sentence is alone on the left side of the page and on the next line.

Some difficulty was encountered in getting our printer to distinguish between the small, trivial period and the larger ('upper-case?) end-of-sentence period. Finally, an extra zero filled with liquid solder was added to the print chain, thereby resolving the matter from a hardware point of view.

Isolated instances of social abrasion have occurred, though, since senior programmers want exclusive use of the big period and restrictions on coders to use only the little one.

Arnold identified himself (herself) as senior member of an information systems staff but, probably in self defense, did not identify any employer.

In fairness, it should be noted that the period used in the illustration accompanying Simmons' original proposal was enlarged by Computerworld *for clarity. Simmons himself is a one-size period advocate. Ed.*

Bid/Asked Quotes Shown

STAMFORD, Conn. – Brokers and analysts can have immediate details of the best bid and asked price on securities listed on either two of the New York, Midwest or Pacific Stock Exchanges with the Q-Quote service from GTE Information Systems, Inc. (GTE/IS).

The service is based on dedicated GTE/IS Videomaster CRT terminals in user's offices linked to GTE's computer center in New Jersey, which is linked in turn to the stock exchanges.

The service covers about 1,200 of the 2,000 securities linked on the New York exchange, a spokesman said.

Conventionally, most brokers focus on just one of the exchanges and are not aware of specific trading activity on the others, he said, adding that Q-Quote is designed to highlight the best quote, wherever it is.

GTE/IS is at One Stamford Forum, 06904.

We can get it up for you.

GBASWIFT is the powerful, effieient teleprocessing monitor for DOS and DOS/VS users.

DATAPRO has rated it abuve all other monitors in overall satisfaction, vendor support and ease of installation. GBASWIFT has capabilities and features not found in the largest, most complex TP systems available, hut its ease of installation and simplieity of use can't he matched by even the smallest mini-monitor.

Teleprocessing is probably the most over-evaluated and least-understood area yuu have to deal with. Evaluations are typieally exhausting, tedious, expensive and, for the most part, wrong. Potential TP users are blinded by buzzwurds and ahstraet nonsense.

At GBA Intemational we know that the only way to evaluate a monitor properly is to install one. GBASWIFT ean be installed and operational in a couple of hours, and your first application can be coded from scratch and running the same day. While other eompanies are making sales presentations, flashing flipcharts, and touting optional Cadillac features, GBA International is in the machine room getting the job done.



If these claims sound outrageous, listen to what some GBASWIFT users had to say when asked about our elaim that GBASWIFT can be "installed in a few hours."

"Unbelievable, but true."
T. W. Dowling, Data Processing Manager, States Steamship Company.

"This is not a claim, it is a fact!"
Florence Harteloo, System/Procedure Analyst, Clark County Public Utilities District, Vancouver.

VENDOR SUPPORT

"Very knowledgeable and competent. A pleasure to work with peuple who 'know' the product and didn't finish some training school just 2 weeks before you did yourself."
Roger D. Mills, Senior Programmer/Analyst, Public Utilities District No. 1 of Snohomish County, Washington.

"They know what you don't on praetically any subject—be it TP monitors, Data Base, or operating systems. Remarkable knowledge of Hardware functioning. Neat people to work with."
Dan Fish, Systems Supervisor, County of Sonoma Data Processing Center.

"GBA International's SWIFT took the lead with a 4.0 in the area of Vendor Support. The other monitors followed, the report said, with Minicomm earning a 3.4; Task/Master a 3.2; Environ/1 and Intercomm, 2.8's; and CICS, a 2.7.
Datapro as reported in Computerworld, p.14, Jan. 22.

PROGRAMMING

"Absolutely—You don't need Super People to write Super Programs. If the programmer can issue a simple Assembler 'CALL' from a Cobol program, he can write TP programs in literally hours."
Dan Fish, Systems Supervisor, County of Sonoma Data Processing Center.

"Within an hour's briefing any average programmer can be writing application programs with GBASWIFT handling all the interfaeing."
Chad Julian, Director of Data Processing and Systems, Kwickset Div. of Emhart Corporation.

"We were able to bring up 3 application programs in one afternoon—
the same day our terminals were tu:..-ed over to us by the vendor's installation team. We had no opportunity to test beforehand, either."
Stu Fletcher, Programming Manager, Cal-Farm Insurance Company.



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COMMUNICATIONS

Intertel Modem Allows Use of Unconditioned Lines

Special to Computerworld

BURLINGTON, Mass. – Users of a 9,600 bit/sec modem from Intertel are finding 9,600 bit/sec data transmission is possible over ordinary, unconditioned transmission lines and most Direct-Distance Dial (DDD) lines as well.

"We ordered unconditioned Bell-3002 private lines for several applications, and Intertel's MCS 9600 modems perform well," according to Gunther Kempin, manager of communications planning and engineering at Manufacturer's Hanover Trust in New York City.

"We can also operate satisfactorily at 9,600 bit/sec over dialed connections through the DDD network," he said.

Users can save money by operating on unconditioned lines, Intertel said. They save telephone company installation fees for conditioning, and every month they pocket the charge that would normally be spent for C2, C1 or D1 conditioning.

In addition to the savings, users notice that leasing unconditioned lines often means shorter average repair times for the lines. The phone company may take less time to restore leased-line service for less tightly specified circuits, some users believe.

The capability to back up the 9,600 bit/sec data traffic on dialed connections is important to on-line users because it means a net can continue to operate when private lines go down without any changes to the DP system.

The user pays only line fees for the time he actually uses the dial backup links.

Joe Rosenberg, manager of communications for El Al Airlines, said he can save El Al $200,000/year by using the Intertel modem on dial circuits and eliminating the rental fees for a backup, 4-wire private line from London to Tel Aviv.

"We tested several domestically manufactured 9,600 bit/sec modems and found the MCS 9600 gave better performance than others, especially over DDD circuits," Dave Stout, communications engineer at Quotron Systems in Los Angeles, said.

"It was the only modem capable of giving acceptable performance at 9,600 bit/sec over the DDD circuits tested," he said.

As well as being a 9,600 bit/sec modem that operates on unconditioned lines, the unit is also reportedly the first to operate with a full-fledged 150 bit/sec secondary channel.

The secondary channel puts 150 bit/sec data on the same lines used for 9,600 bit/sec data and eliminates the lower speed lines. Use of the secondary channel option will further increase savings by eliminating the need for separate teletypewriter circuits in El Al's network, Rosenberg said.

Other options available for the Intertel modem include a built-in buffered multiplexer with switched carrier control and an automatic dial backup module that enables CPU-site personnel to establish dial backup circuits without the aid of remote-site personnel.

Intertel is at 6 Vine Brook Park, 01803.

SDLC to Have Impact on Communications Gear

By Robert F. Wickham
Special to Computerworld

Synchronous Data Link Control (SDLC), the communications line discipline associated with the IBM System Network Architecture (SNA) offers a number of significant advantages to users of data networks.

Since SDLC, in some form, is destined to become the industry standard protocol for exchanging information between termination points in networks, the impact on users and suppliers of data communications hardware will be enormous.

With the SNA concept, users and suppliers have a common point of departure in planning and implementing teleprocessing networks of all sizes. In addition, SDLC formatting of the data interchange between points in a network permits the intermixing of common carrier, value-added network or satellite facilities for the communications links.

Defines Interaction

SNA defines the way in which the various elements of a teleprocessing system interact to provide an efficient and reliable interchange of information. As defined by IBM, this network architecture is implemented by a combination of hardware, software and a data link control or line protocol.

By distributing processing and control functions throughout the network, a general-purpose network architecture is created which is capable of handling a wide range of transaction types, terminal hardware and network delays.

At the present time, SNA hardware implementation is by means of a VS/370 host computer with a 370X programmable front-end processor. Terminal systems are application-oriented and include the 3600, 3650 and 3660 transaction-oriented systems, the 3790 general-purpose processing terminal, the 3770 remote job entry system, the 3767 printing terminal and the 3270 CRT terminal.

All terminal devices contain some amount of processing and memory and are designed for a distributed-processing environment.

Software for implementing SNA includes a Virtual Terminal Access Method (Vtam) which connects the terminals with the applications programs and the virtual operating system (OS/VS).

Network and terminal control is delegated to the Network Control Program (NCP) resident in the 370X front-end processor.

The link between the host processor and the processors in the terminals is by means of the SDLC line protocol. The system software also provides for on-line diagnostics and fault reporting for equipment connected to the network.

Provision is also made for handling binary synchronous and stop/start line disciplines and terminals.

The availability of a line protocol such as SDLC, particularly if it is adopted as an industry standard for handling the exchange of information within a network, permits users to implement larger and more complex networks which can accommodate a wide variety of terminal and transaction types.

Although the exact definition of SDLC is quite complex and still in a state of flux, SDLC incorporates such features as full-duplex operation, cyclic redundancy check error-detection techniques, variable information field length and the ability to handle synchronous and asynchronous terminal equipment. SDLC is speed transparent and, therefore, can be used at all levels within the network.

In the past the combination of Binary Synchronous Communications (BSC); an access method such as Qtam, Btam or Hasp; and hardware which emulated IBM terminals gave the independent teleprocessing hardware and manufacturers access to IBM systems. Likewise, the new combination of Vtam, NCP and SDLC provides an opportunity for further expansion of the IBM-compatible terminal and front-end processor. In addition, as other mainframe suppliers adopt SDLC as the standard for their systems, the amount of independently supplied equipment will grow.

The widespread use of SDLC will not occur overnight; rather it will require several years to fully assimilate and respond to the benefits and problems associated with the change to SNA and SDLC.

The complexity of the hardware, software and communications protocol inter-

(Continued on Page 22)

FDS/1 Releases Terminal for Thrift Institutions

ORLANDO, Fla. – The FDS/1 Division of TRW has introduced an on-line teller terminal designed for statement savings, checking and credit-card transactions at thrift institutions.

The TT-140 is described as the first nonpassbook teller terminal to incorporate in one unit an alphanumeric printer and a tutorial display that works with a back-lighted keyboard.

The unit also features an integrated plastic card reader, plus stand-alone capabilities when operating off-line.

The terminal is a little smaller than an electric typewriter. It is geared to thrift institutions – savings and loans, mutual savings banks and credit unions – complementing passbook savings plans with statement savings, the firm said.

The microprocessor-based statement savings terminal is said to be the first in the thrift industry to include a self-contained alphanumeric printer. This allows validating and receipting with identification of savings deposits, loan payments, drafts or checks, and data can be transmitted in English – instead of teller code, the firm said.

Indicator lamps are used as a tutorial guide to lead the teller through the transaction by asking for account, number, balance and amount. This tutorial capability coupled with the back-lighted keyboard keeps the teller informed of where the transaction is and what should be done next. Also, alter lights inform the teller of an error condition.

Personal Identification Numbers

The plastic card reader can work in conjunction with an optional ten-key security pad on which the customer enters his secret Personal Identification Number (PIN) to provide positive identification. This procedure can familiarize customers with the use of the plastic card and can be the initial step in electronic funds transfer systems (EFTS) and point-of-sale (POS) services, the company said.

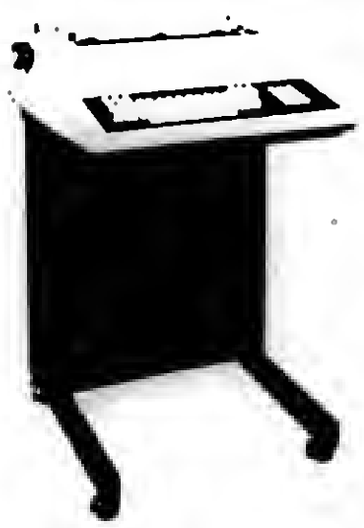
The keyboard features 22 function keys and eight status/alert keys which can be defined by the institution.

The terminal is compatible with earlier terminals used in the TRW transaction processing system. The TT-140 shares the same communications lines and can be linked to existing TT-108 teller terminals, a branch terminal controller or directly to a terminal processor.

The price of a typical transaction-processing system, including four TT-140s, four TT-108s and two CRT administrative terminals ranges from $57,000 to $71,000.

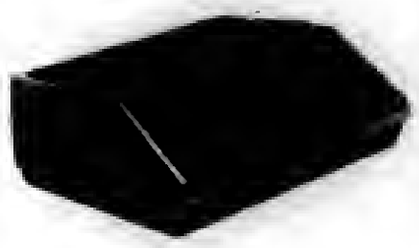
Software and installation management are included. Deliveries of the TT-140 will begin in the fourth quarter from 3606 Silver Star Road, 32808.

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(left) *AJ 830*, the new 30 cps impact printer terminal which features quality and reliability.

(below) *AJ 841*, the rugged Selectronic™ printer terminal. A cost effective replacement for the IBM 2741.



(right) *AJ 230*, a mobile acoustic Teletype terminal. (Also available in auto-answer and TWX/DDD versions).

(below) *AJ 630*, a 30 cps quiet non-impact printer terminal with 140 character print line. (APL is an option).





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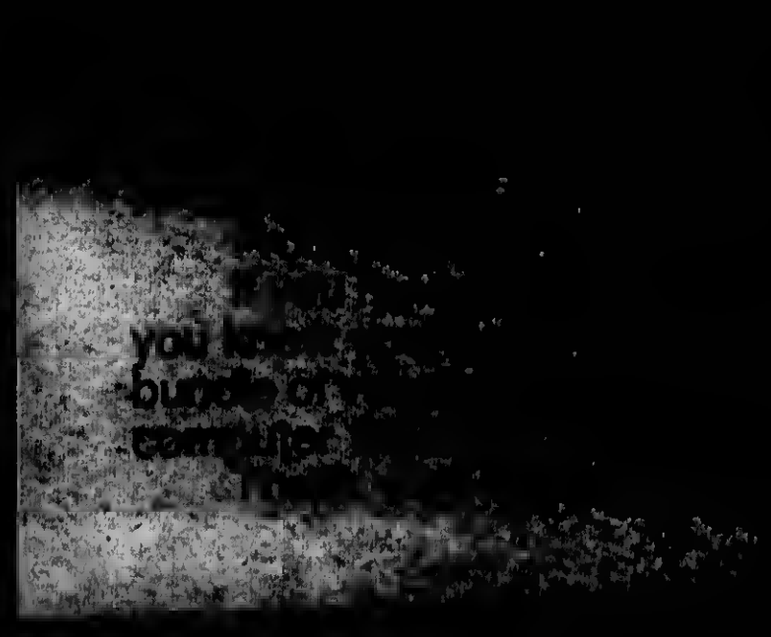
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And Tape Cassette Recorder

Trendata Adds 4000P Teleprinter Unit

SUNNYVALE, Calif. – Trendata's Model 4000P terminal is designed for high throughput and accuracy and provides up to six copies on a 30 char./sec daisy-wheel printer.

The keyboard configuration follows the IBM Selectric layout and is surrounded by clustered control keys, Trendata said.

The keyboard also includes a 10-key numeric pad with an operator-programmable field delimiter key.

Standard features included with the 4000P are switchable 10- to 12-pitch character spacing, switchable 10- to 30 char./sec send/receive speeds, vertical forms control and Ascii coding.

The base one-year lease price on the Model 4000P is $180/mo including maintenance.

Tape Cassette Recorder

Trendata has also added the Model 4000 tape cassette recorder (TCR), which allows users the capability to prepare data off-line for later local use or transmission to other terminals or remote CPUs.

Local editing features include the capability to edit data being recorded in character, word or line increments and the ability to search, at high speed, recorded data (forward or reverse) to any of 4,800 addresses on the tape.

Multiple tape decks can be connected to allow merging of data and other applications requiring multiple deck usage.

Savings in connect time can be achieved in the conversational terminal environment when data is recorded and edited off-line for later transmission to the host CPU at speeds of 10-, 15-, 30- or 120 char./sec, the firm said. Control codes, generated from the Model 4000 line of terminals or a remote CPU, dictate the operation of the 4000 TCR.

The one-year lease rate for the Model 4000 TCR, including maintenance, is $75/mo from the firm at 610 Palomar Ave., 94086.

Terminal Transactions

'Floppy Killer' Has Processor

UTICA, N.Y. – The Cogar Corp., a subsidiary of the Singer Co., has introduced a low-cost intelligent terminal with a 16K-byte processor and hard disk storage.

The Singer Model 1501-40 intelligent terminal is dubbed the "Floppy Killer" because it is said to rival the economy of a floppy disk system while offering the performance and reliability of a hard disk with up to 5M characters of storage capacity.

The 1501-40 is designed for stand-alone data centers or multiple remote sites, where reliable random access to data files (which floppy disks are not designed to provide) is a necessity.

The terminal can interface with IBM, Univac, Singer and other mainframes. Interfaces have been developed that allow the 1501-40 to emulate the IBM 2780, 3780 and 360/20.

The on-site disk is said to reduce the amount of data that has to be transmitted to the central site by remote offices. The fixed disk can be updated by automatic down-line data loading.

The basic 1501-40 includes a keyboard CRT, cassette drive, processor with 16K of storage, serial I/O channel and a 2.5M-byte fixed disk.

This configuration costs $13,600; one- to five-year leases are available. A communications option for either asynchronous (to 1,800 bit/sec) or synchronous (to 9,600 bit/sec transmissions costs $1,222.

First deliveries are scheduled for January from Cogar at Cosby Manor Road, 13502.

Graphics Unit Costs $2,995

BEAVERTON, Ore. – Tektronix, Inc. has introduced the 4006-1, the firm's lowest cost graphics terminal.

The unit sells for $2,995 and leases for $150/mo on a two-year lease.

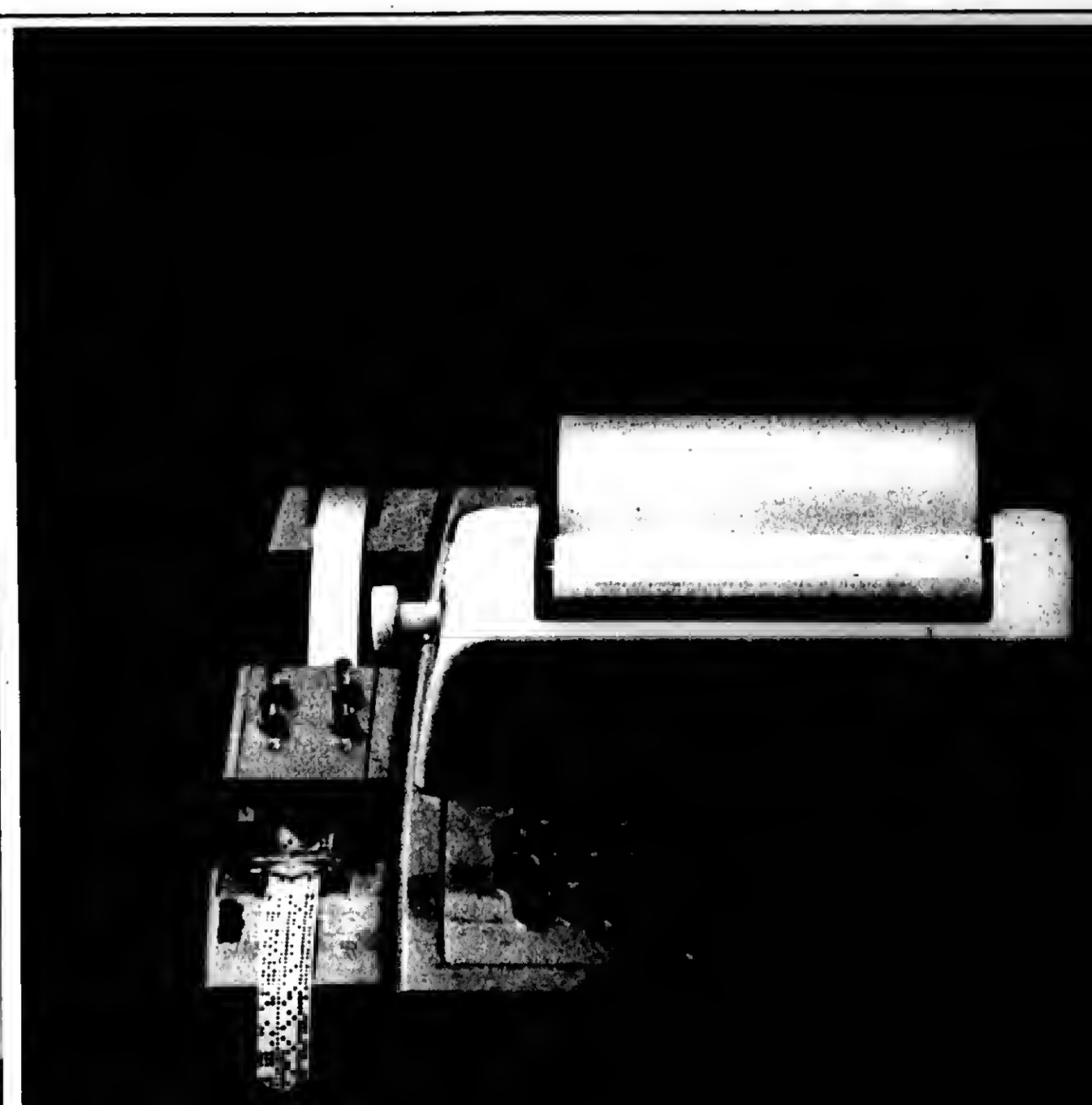
An interactive graphing package written in Fortran allows the user to generate graphics using English, the firm said.

The 4006-1 has selectable data rates from 75- to 4,800 bit/sec. It is compatible with RS-232A, -B and -C interfaces.

There are two modes of operation, Alpha and Graf. In the Alpha mode, the screen can display 2,590 characters, or 35 lines with 74 char./line.

A 5 by 7 dot matrix is used and there are 63 printing characters. In the grahics mode, there are 1K by 1K addressable points, the firm said.

The 4006-1 will be available Oct. 20 from the firm, whose address is Box 500, 97005.



User Skirts RJE Limitations With Management System

ALBANY, N.Y. – Unhappy with the traditional limitations of remote job entry (RJE), the State University of New York (Suny) Research Foundation here has taken a different approach to terminal utilization.

The foundation developed a combined real-time and batch system, known as the Remote Entry Management System (Rems), to manipulate its central computer and to avoid contention with other system users.

Rems has been operating successfully for the past four years, averaging 20 hours a day, six days a week.

To accomplish its tasks, the foundation leases a portion of Suny's central computer, an IBM 370/158. A teleprocessing network of IBM 3270 terminals links most of Suny's campuses, plus other participating institutions throughout the state, to the Albany site.

Each day, remote offices interact with the 370 to extract information from its data base and enter new transactions. The foundation capitalized on this real-time data entry and combined it with multitask batch processing to come up with Rems.

'Aversion to Hardware'

"I think we have an aversion to hardware," James D. Dillon, the foundation's assistant director, said.

"We are by nature service-oriented, that is, tied to results rather than methods. If we thought the foundation could effectively serve its clients with a minicomputer, we would probably do it.

"However, we need the large, disk-based facilities of Suny's 370. We also need autonomous control over our own programs to ensure we fulfill our administrative obligations and meet our tightly scheduled payroll commitments without scheduling interference from other system users.

"For this reason, we developed Rems," he explained.

Rems is neither a hardware device nor a software package but a concept, born of necessity and designed to manage a large computer resource from a remote location, he said.

"Initially Rems began as RJE. However, we were not willing to live with the traditional limitations of RJE. We had to do away with unit record concepts and the master/slave approach normally associated with RJE.

"Rems provides us with 160-character output records and succeeded in reversing the master/slave relationship between central CPU and RJE terminal," Dillon said.

Control Where It Belongs

With a Mohawk Data Sciences 2400 system equipped with card reader, two printers and a CRT as well as a modified Hasp package in the 370, "we have effectively relocated the 370's operator console to our own corporate headquarters. Total control of the foundation's information system is where it belongs – at the foundation," Dillon said.

"From here, our programmers can compile their own jobs; we can monitor the status of the terminal network, and our own console operator can access the system as needed.

"By maintaining all our files on-line, we don't have to rely on the mainframe operator, except to keep the system running," Dillon said.

The principal liability which Rems confronted, according to Dillon, was insufficient control by the remote operator over his own jobs. Under traditional RJE concepts, the remote operator can only enter Hasp commands. Also, application program operator messages are normally routed only to the mainframe console.

Rems provided the following solutions:

- A command was added to the Hasp repertoire which allows the remote operator to cancel his own jobs directly, even during execution, without having to bother the mainframe operator.
- The Hasp console support routines were modified to display and log operator messages from application programs directly at the remote workstation.

The remote operator can also reply directly to these messages. Previously, jobs which relied on an operator for input or control data required the remote operator to call the mainframe operator to enter the correct sequence of replies.

- The Hasp command processor was improved to ensure the proper remote station is replying and to allow either the mainframe or remote operator to logically vary the remote CRT console on- or off-line.
- The Hasp repertoire was also altered to display outstanding replies only for the requester, thus providing a certain amount of privacy for messages directed only to the Rems operator at the foundation.

"The sum total of these changes has provided the foundation with control over remotely submitted jobs comparable to what we would enjoy in a local, dedicated environment. And we receive these benefits without the economic burden of a separate mainframe," Dillon said.

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TELETYPE

SDLC to Have Impact on Communications Hardware

(Continued from Page 18)

actions in SNA will make the connection of non-IBM terminals to IBM systems a formidable job. The availability of low-cost minicomputer and microcomputers will play a significant role in new terminal designs, and terminal software or firmware will be used to ensure terminal compatibility in any particular IBM teleprocessing system.

Another option for independent hardware suppliers is to provide a complete teleprocessing system with the Vtam-NCP interface being the system access point.

Over the next few years, the semiconductor suppliers will introduce families of LSI chips which will provide an economical method of implementing SDLC at the hardware level. This will have the effect of making future SDLC-compatible terminals price competitive with existing asynchronous and bisynchronous terminals.

The hardware most affected by the introduction of SDLC includes front-end processors, concentrators, multiplexers, modems and the entire range of interactive and batch terminals. In most cases, SDLC will have the effect of accelerating the movement of large corporations and government agencies to large, general-purpose networks interconnecting a number of host CPUs and a variety of terminals.

New Technologies

Concurrent with the introduction of SDLC, the U.S. is undergoing a rapid expansion of its data communications channel capacity. The widespread use of satellites is imminent and will significantly reduce the cost of broadband data links.

SDLC is but one of a number of new technologies stimulating the growth of data communications facilities.

The change from hard-wired to programmable front ends will be given added emphasis by SDLC. The shifting of the network and terminal control functions to a separate peripheral processor improves the efficiency and throughput of the teleprocessing system.

The rapidly decreasing costs of minicomputers and the availability of standard communications software packages from both the mainframe suppliers and the small computer vendors will continue to encourage the transition.

Hardware Changing

The hardware for various network control functions such as concentrators and multiplexers is also changing from hard-wired to programmable. The use of processor-based remote concentrators permits the system to change to meet future growth and performance needs.

In the short term, while the industry is changing into the SDLC environment, thesc programmable processors will be used throughout the network to enable the non-SDLC portions of the network such as terminals or dedicated data links to interface to the general-purpose SDLC network.

The change to SDLC in networks will require full-duplex modems. Although some full-duplex modem products are currently available from Bell and the independents, a new need exists for 1,200- and 1,800 bit/sec full-duplex modems with sophisticated features such as on-line diagnostics as an integral part of the hardware.

The rapid growth of the packet-switching networks, which will also use SDLC, has created a need for high-speed, full-duplex modems. As large corporations implement internal networks, high-speed modems will continue to expand.

Terminal Area

Perhaps the greatest needs and problems exist in the terminal area. With well over one million terminals in use in the U.S., some means of gradually converting to SDLC is necessary.

In some networks, programmable node processors will be used to accept the input from bisynchronous and asynchronous terminals and reformat the data into SDLC-compatible form.

Terminals designed for the SDLC environment will incorporate an "SDLC front end" which provides the necessary formatting, insertion of command bits and error detection. Through the use of microprocessors and LSI, these SDLC terminals will cost little more than existing devices, but provide up to twice the system throughput.

Wickham is with Vantage Research. This article is based on a presentation given at the recent Western Electronics Show and Convention (Wescon).

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Burroughs AE 501 Audit Entry Data Preparation System

Has Program Generator

Burroughs Key-to-Cassette Bows

By Patrick Ward
Of the CW Staff

DETROIT – The AE 501 Audit Entry data preparation system is both the standard Burroughs data entry device from now on and a forcrunner of the company's future data entry equipment, according to a Burroughs spokesman.

The stand-alone 16K device offers "more efficient, more productive and more controlled data entry than other types of data entry equipment," the spokesman said.

The system is designed to edit and validate data as it is keyed and then capture clean data on magnetic tape cassettes. The aim is to correct errors at the source and so reduce time-consuming verification runs at the host CPU, the spokesman explained.

The AE 501 can bc used in either a centralized data entry pool or in user departments for distributed data entry. Synchronous or asynchronous communications capabilities are optional.

The system's paper output serves as both a journal record of the data recorded on tape and a logging medium for errors, Burroughs said.

Burroughs will supply data preparation software for the AE 501 that is paired with Burroughs Business Management Systems (BMS) software applications for use on the firm's B700 and B1700 CPUs.

On-Board Generator

The AE 501 has its own onboard program generator that allows the user to create his own programs, the spokesman said.

As the user prepares the file outline for the AE 501, he is concurrently preparing a system handler program on tape that allows the host computer to deal with the data the user has created on the AE 501.

Either the vendor's packages or user-written programs can allow for range checking, alphanumeric check digits and any desired number or level of batch totals. They can also provide a printed audit trail plus first-level management reports.

The single or dual magnetic tape cassettes on the AE 501 provide for firmware and software loading, data capture, data recall and batch transmission.

The AE 501 represents a "second-generation" version of Burroughs earlier AE 300 data entry device, the vendor said. The AE 501 has a 60 char./sec printer and built-in communications; the AE 300 has neither. The AE 300 also lacks the AE 501's onboard program generator.

Burroughs said it will continue to market the less expensive AE 300 for the time being, however.

The AE 501 costs $9,940 and leases at $295/mo. Immediate delivery is available, the firm said.

NCR Data Entry Device Uses Intel 8080

DAYTON, Ohio – The NCR 7200 Model 1 is a microprocessor-based data entry device designed for off-line data capture on tape cassettes.

NCR is currently aiming the 7200 at the firm's Century, 399 and 8200 CPU users who have fewer than four data entry devices, an NCR spokesman said.

The company said the 7200 is the first in a line of microprocessor-based data entry units. Other models, scheduled for introduction later, will include on-line inquiry capabilities.

Standard features on the basic Model 1 are: 128-character display buffer, detachable keypunch or typewriter-style keyboard with 10-key numeric pad, single cassette, Ascii 64-character set and 9-in. CRT screen.

Optional features are: 256-character display buffer, thermal printer interface, dual cassette, up to three check-digit verification schemes, up to four accumulators, operator lead-through, 512 bytes of additional memory for additional format storage and 128-character Ascii set.

The top half of the CRT screen can accommodate 128 characters. The lower half is used for operator messages or system status messages.

The 7200 currently offers asynchronous remote-batch communications and will support bisynchronous communications by the end of the year, NCR said. The company also plans to eventually offer Synchronous Data Link Control (SDLC) compatibility on the 7200.

The terminal can operate in eight modes: data entry, data verify, search, format entry, format verify, format display, transmit batch and receive batch.

Cassettes used with the terminal are Ansi-compatible and can be read into the full line of NCR computer systems, starting with the NCR 299 series up through the Century series. Each data cassette can store over 300,000 characters. The recording density is 800 bit/in.

The Intel 8080 microprocessor used in the terminal features a 5-μsec instruction cycle, four addressing modes and a repertoire of 78 hardware commands.

The microprocessor and its associated read-only and random-access memories direct all buffer allocation, data formatting and input/output traffic betweeen the terminal and its peripherals.

The basic Model 1 prices begin at $5,300 purchased and $140/mo rental.

Delivery begins in November.

Univac Adds Disk Drive For 90/30

BLUE BELL, Pa. – Univac has introduced a 57.9M byte/drive removable disk system for its 90/30 computer line, plugging the hole between its previous 28.9M-byte and 100M-byte removable disk models.

The disk drive, "new from the ground up," comes in two models, the 8418-94/95, which has the 57.9M-bytc capacity, and the 8418-92/93.

The smaller 92/93 has the same capacity – 28.9M bytes – and price as thc current 8416 disk, but has additional refinements and can be field-upgraded into a 57.9M-byte 94/95 model, a Univac spokesman said.

Univac is phasing out the 8416, he added.

Among the refinements the 8418 models offer are a better airflow system, more positive pressure seal of the disk pack area and better reliability and maintainability, Univac said.

Both of the 8418 models can be attached to the F1621 integrated disk adapter (IDA) in any combination and utilize the same F1216-02 disk pack. The 8418 can be intermixed with 8416 drives on the same IDA depending upon the OS/3 software level used.

The 8418's single-unit modularity facilitates the installation of additional drives to allow thc user a growth path for mass storage expansion, Univac said.

Utilizing the Programmed Servo Offset technique, the 8418 can respond to a command to move the accessor a small amount from its designated track location.

This feature is useful in recovering marginal data due to servo or head alignment inaccuracies or small magnetic defects, the company said.

One Disk Spindle

Both models are housed in a cabinet with one disk spindle. The 8418-94/95 utilizes all 815 cylinders of the F1216-02 disk pack; the 8418-92/93 reads or writes data only on the outer 411 cylinders of the disk pack.

If more than four disk drives are attached to a 8418 subsystem, the T2408 IDA expansion feature is required. A maximum 8418 suhsystem consists of eight disk drives.

The Univac 8418-92/93 rents for $385/mo including maintenance and sells for $14,880.

The 8418-94/95 drive rents for $545/mo including maintenance and can be purchased for $22,080.

The F1621-00 IDA feature rents for $300/mo including maintenance and sells for $12,000.

The F1216-02 disk pack rents for $25/mo and sells for $500.

First customer deliveries of the 8418s are scheduled in November for the 92/93 and March 1976 for the 94/95.

IBM 7090 User Group Forming

TERRE HAUTE, Ind. – Users interested in forming an independent IBM 7090/94/9411 users group can contact Terry Harris at Indiana State University's Department of Physics.

Harris would also welcome hearing from users who still have 7090-compatible programs in their archives.

"We installed a 7090 in 1973," Harris noted. "Except for some help from Purdue University during the installation, we have maintained it ourselves and have been very satisfied with its performance."

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Computing Power Through an RJE Terminal



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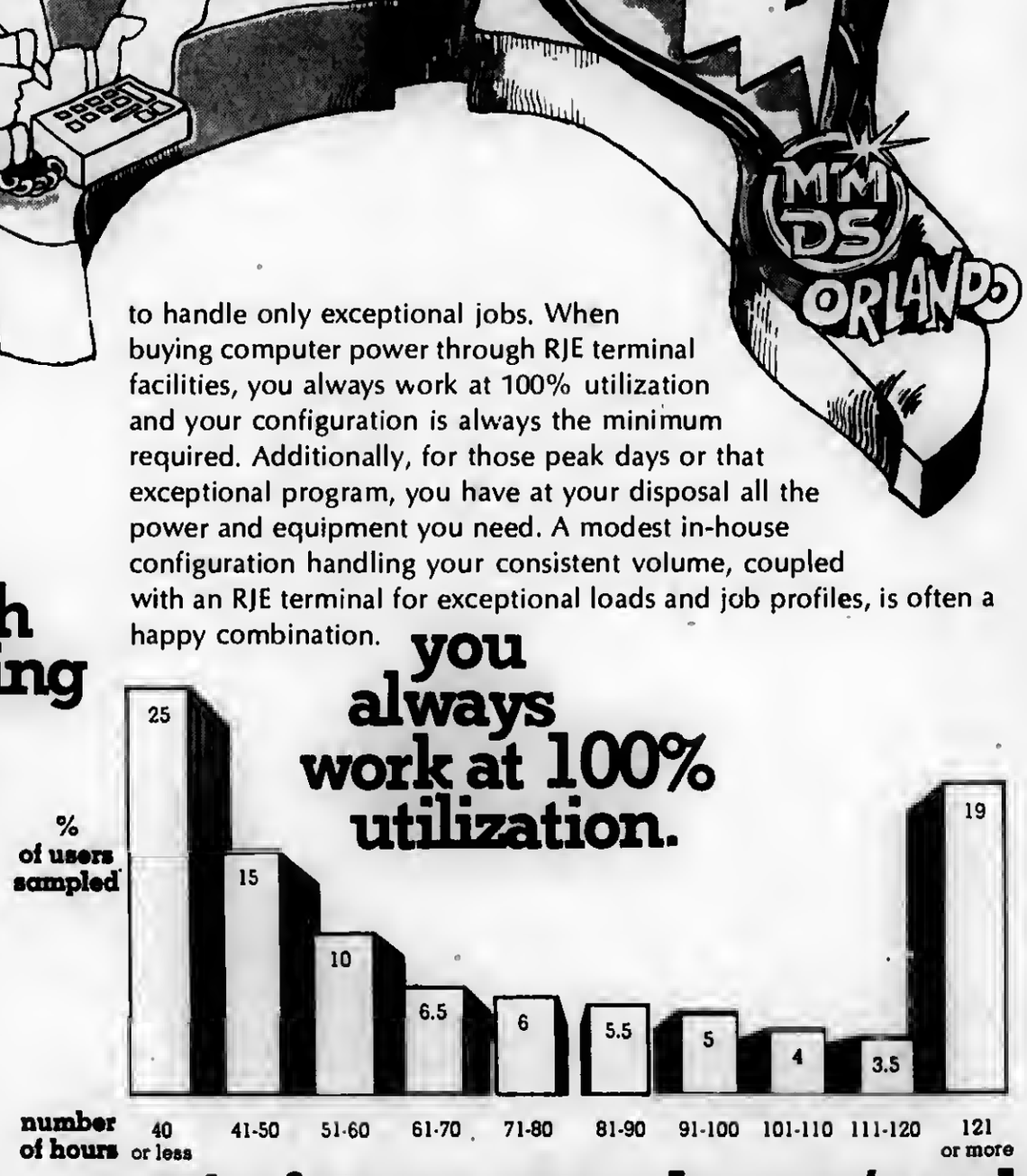
You handle the on-site RJE terminal card readers and printers just as you would your own machine. You can use video display keyboards instead, add tapes or use a small IBM computer at the terminal location. You get as much local processing as you want — batch or interactive — with planned overflow back to the MMDS computer centers. The connection is by way of the MMDS network, intermixing high and low speed data on high speed duplex lines. The network simplifies the handling of data processing for the decentralized company. The complex of large computers and high speed lines afford economies of scale and reliability.

as much local processing as you want.

The Elastic Configuration

A company's data processing load fluctuates from hour to hour, day to day, and week to week. The average computer, configured for the worst situation, is under half loaded. Not only does the load fluctuate; the configuration requirements change. A hidden source of under-utilization is the capacity (memory size, channels, line handling capability and peripheral devices) that exists to handle only exceptional jobs. When buying computer power through RJE terminal facilities, you always work at 100% utilization and your configuration is always the minimum required. Additionally, for those peak days or that exceptional program, you have at your disposal all the power and equipment you need. A modest in-house configuration handling your consistent volume, coupled with an RJE terminal for exceptional loads and job profiles, is often a happy combination.

you always work at 100% utilization.



A Technological Umbrella

For hardware reasons, a company may elect to handle part or all of its load through an RJE arrangement; developing additional systems or implementing its new strategy on the MMDS facility. This is a simple, flexible and economical way to move forward. The same case applies for the technology. MMDS has 50 technical development people working in the VS, TSO, IMS, CRJE and communications areas. The software environment they create and enhance is used by our clients, by us and by our parent company. It has to be effective and it has to be up-to-date. The use of an RJE terminal not only smooths load and configuration requirements for the in-house computer owner; it taps into up-to-date hardware, communications and systems software. It is a flexible, fully supported means of developing the company's computing plan without the normal hardware shuffling and software R&D.

capabilities snapshot

HARDWARE
MAIN FRAMES:
370/168's 360/50
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370/155 EAI 8400
DISKS:
2314, 3330–single and double density
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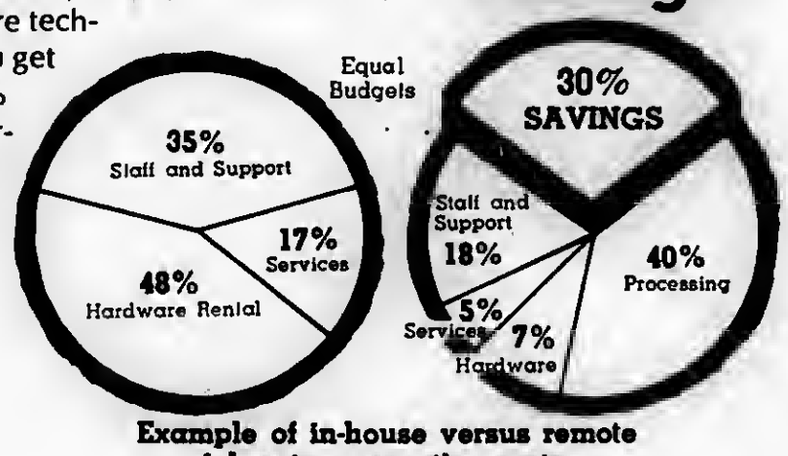
You may be doing a lot of batch work now but be planning for conversion to real-time processing. Or your loads may be planned to move sharply. Perhaps you're centralizing or decentralizing your data processing arrangements. Owning your own equipment can be a considerable constraint in implementing your plans and renting equipment is expensive. In any case, continued shuffling of hardware is an unwelcome intrustion on management's time. To get the best price performance from IBM, you need the latest (and largest) equipment, but this may be in conflict with your needs, the economy of purchase ownership and the stability required for internal performance. Utilizing the MMDS computer/network utility keeps your options open into the future; avoids cash outlay; gives you the flexibility you need as your operation changes and develops; and affords the price performance benefits of large purchased machines and high speed lines.

keeps your options open!

Releases Cash for Systems Development

More and more, as some of the excitement falls away from the computer aided business systems area, the data processing executive is fighting for his budget. But now is the time that companies should be putting major effort into systems development: the software environment, the cost of computing equipment and the systems philosophy of interactive computing (with data base organization and distributive processing) are all coming together into a practicable technology for business systems implementation. Many computer set-ups, though, are locked into depreciated hardware and heavy on-going maintenance loads. Satisfying some or all of your computer power needs through terminal facilities can release significant cash for the system development budget. You don't have the same money tied up in hardware; you don't have the software technology R&D load; you get the economy of 100% machine and configuration utilization; and you get the economy of scale inherent in larger, up-to-date machines and faster lines.

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Example of in-house versus remote job entry computing costs.

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For more information on our computer power services, MAS ranges, or systems and programming capabilities, please contact:

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Frequency Converters Fit 370s

DEER PARK, N.Y. – KW Control Systems has noise-reducing, enclosed 75 kVA, 415-Hz frequency converter units for IBM 370/165s and 370/168s.

The enclosed frequency converter units incorporate an IBM-approved 415-Hz frequency converter into a noise-reducing enclosure, both of which are manufactured by Anton Piller KG of West Germany.

Conforms to Standards

As a result of the noise reduction, the enclosed unit conforms with standards set forth by the National Bureau of Standards for computer room equipment. The unit is quieter than a disk drive or printer, KW said.

The units can be installed directly into the computer room. The unit measures approximately 71- by 26- by 60 in. and weighs 3,000 lbs.

Reduces Costs

The user can reduce his installation and operation costs by eliminating the need for a separate room for the frequency converter, decreasing the length of the high-frequency cable between the computer and frequency converter and improving the security of the installation by combining the system in one room, KW said.

The enclosed unit costs $21,780 vs. $16,800 for the standard, 415-Hz frequency converter. Delivery is quoted at four months by the firm at 151-17 W. Industry Court, 11729.

Hospital to Save $15,000/Year With IV Supply, Billing System

By Stephen L. Priest
Special to Computerworld

BROCKTON, Mass. – Brockton Hospital has implemented an intravenous (IV) solution supply and billing system that not only cuts administrative time but will save the hospital an estimated $15,000/year in previously lost billings.

The former system required nurses to prepare a separate charge ticket each time an IV solution was taken from the floors' IV stock supply. Many times the nurse could not take the time to complete the charge ticket.

Many billings were completed incorrectly and could not be used for billing purposes. In general, the former system was not only tedious and time-consuming for nurses, but also resulted in lost IV revenue.

The new procedure is based on a modification of the NCR Inpatient Record Package running on the hospital's 32K NCR Century 200 computer.

Under the system, the DP center's 1,500 line/min printer produces a daily alphabetical patient printout for each nursing station.

This requires no special data entry because the data comes from the computer's daily inpatient record billing file, which is updated at 1 a.m. with the previous day's admissions, discharges and transfers.

The printouts reach the pharmacy before 8:30 a.m. seven days a week. A pharmacy aide then brings one to each nursing station's IV stock area. He removes the printout from the previous day and posts the new one.

Gummed Identification Labels

When a nurse requires an IV solution from stock, she pulls off the identification label on top of each solution bottle and sticks it on the printout next to the patient's name. (Patients admitted or transferred during the day must be initially handwritten onto the sheet.)

The pharmacy has prepared the gummed labels beforchand to identify the different IV solutions and has attached the labels to the top of the solution bottles before their delivery to the floor.

A pharmacy aide tallies the previous day's printout to determine the number of IV solutions used and how many need to be restocked to keep supplies at a predetermined level.

Since the aide knows how many solutions he delivers daily, his total tally also includes the number that were used and not noted on the printout. While some IV use still goes unrecorded, it is far less than before.

The pharmacy billing secretary then uses the previous day's printouts to determine the IV cost for each patient. Each nursing station sheet is then added up to reach a total IV cost, and the information is forwarded to the DP area.

The DP staff keypunches each patient's number, the date of the printout sheet, the hospital's cost for the IV solution used and the code for the particular solution. The computer calculates each patient's charge from the cost to the hospital.

The keypunching is done on an IBM 129 unit that accumulates the charges for each patient in a particular nursing station. When the data entry operator finishes keying in the individual patient records, he compares that total with the total charge computed by the pharmacy's billing secretary.

If the totals match, DP does not key-verify the punched cards. The used printout sheets then go back to the pharmacy for future reference.

The new IV supply and billing system saves valuable nursing time that can be devoted to additional patient care. The system has demonstrated to nurses that computers can assist them in their daily functions; they are enthusiastic in their praise for this new system.

The chief pharmacist estimates the new procedure will increase IV solution revenue by over $15,000/year by eliminating lost billing tickets.

The system has also uncovered deficiencies in the par levels of many nursing stations which cause one station to borrow from another floor or to make urgent requests for pharmacy to make unscheduled deliveries.

Thus, the new system eliminates unscheduled pharmacy deliveries and more closely monitors stock levels.

Priest is the manager of data systems at the Brockton Hospital, Brockton, Mass.

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Planning Helps DP Center Move 10 Miles in Two Days

NEWPORT BEACH, Calif. – Comprehensive planning helped Great Western Savings and Loan Association move its IBM 370/158-based data center 10 miles to a new building here over a two-day weekend, according to John Singleton, vice-president and manager of the Systems and Data Processing Division.

"What is perhaps even more significant is that, after having moved the entire facility, the first day of operation subsequent to the move was flawless – no hardware or software problems of any type," Singleton said.

"As a matter of fact, the first week of operation after the move was accomplished with a 98.2% on-line system uptime and a 100% reports distribution percentage," he said.

The challenge to the Great Western staff was to move all equipment and personnel in one weekend without interrupting normal on-line or batch production and without hiring outside consultants, other than the normal IBM and building contractor personnel, he said.

At 7:25 p.m. on July 17, after six months of planning, the "Power Off" switch was pressed, terminating eight years of operations at the firm's Santa Ana data center.

At 7:24 p.m. on July 18, IBM field engineers turned over the computer system to the Great Western staff for on-line system testing, Singleton said.

So, in less than 24 hours, a major large-scale on-line computer system was disassembled, moved, reassembled and operational, Singleton said.

Eight hours later, after successful on-line testing, the normal weekend production cycle was started – just 32 hours after system shutdown at Santa Ana.

Not a Small System

With 90 separate California branch offices, Great Western has one of the largest branch networks of any savings and loan association in the U.S.

Applications include on-line savings, loan, financial and management information systems which support a 350-terminal network 11 hours a day, five days a week.

The 1M-byte 370/158 handles an average of 60,000 on-line transaction/day with a peak daily workload of 100,000 transactions during quarterly reinvestment periods – all on the basis of a 2- to 5 sec terminal response time.

Peripheral equipment includes 20 IBM 3330 disk drives, three tape units, two high-speed printers and an IBM 3705 communications control unit.

The Move Plan

The key to the success of the data center relocation was, in the words of the responsible IBM field engineer, "the most comprehensive and well-prepared move plan I have ever seen."

The plan itself was the culmination of months of joint effort between Great Western and IBM. It tried to consider every conceivable aspect of the move with special emphasis on contingency alternatives and numerous intermediate measurable milestones.

Since the move plan covered not only the events during the actual move, but also considered necessary premove actions, several milestone schedules were developed from a general schedule covering the period February through July to a very detailed milestone schedule which addressed the actual move.

Detailed responsibility/contact lists were developed to establish premove, during-the-move and postmove planning and execution responsibility.

These lists were developed to eliminate duplication of effort and to insure effective coordination with a series of checks and balances among all parties involved.

Extensive documentation identified the exact location of every piece of furniture and equipment – both its location at the Santa Ana facility and at its new location.

All employees involved in the move received packets which described their responsibilities and provided detailed explanations of exactly what was to occur during the relocation weekend.

Narrative descriptions of all significant events reinforced the time-phased charts and bar graphs included in the plan.

Most Important Factor

Important as the actual plan was, it was subordinate to the value provided by the planning process itself, Singleton remarked.

This process was the vehicle which literally forced all parties involved to consider every imaginable detail associated with the premove, move and postmove requirements.

"Without this type of comprehensive analysis, a successful relocation could have only occurred through pure good fortune," Singleton said.

The planning process was conducted by defining end-point requirements – what Great Western wanted the new facility to be like; and by defining critical intermediate requirements (working backward from the end-point requirements to do what was necessary to achieve them).

"Worst case" planning, which involved constructing courses of action based on failure assumptions for all key intermediate milestones, also took place, as did a follow-up and reevaluation of all assigned tasks.

This planning cycle was not a "one-shot" approach, Singleton noted. The cycle was repeated many times until it was felt that every conceivable action necessary to insure a successful relocation had been accomplished.

A significant portion of the planning process was dedicated to premove testing, such as testing the new facility's air-conditioning capacity.

The Data Center relocation planning process took place within a "management by results" (MBR) framework.

MBR as applied to the Great Western DP environment consisted of:

- A project control system which provided for orderly project development and established an objective means through which users and corporate managers could measure project performance.
- A user education and communication system which minimized user/data processing conflicts.
- An individual commitment system through which work standards and goals were established and individual performance was measured.

The net result of the planning effort for the data center relocation within the MBR framework was the successful move of the Great Western data center in less than 24 hours.

Special message for 900 about-to-be DEC buyers.

For you 900 or so persons who are planning to buy a DEC system in the next two years, we heartily endorse your judgment. We have, in fact, three DEC system 10's in-house. But if you contact us now, before you close your deal, you have an excellent chance to improve your DEC system cost and operating picture.

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Mini/Mainframe Combo...Answer to Decentralization?

By Vic Farmer
Of the CW Staff

WASHINGTON, D.C. – The use of minicomputers alone in decentralized data processing has been said to be the wave of the future.

But a more effective answer to the centralization vs. decentralization question may be to combine minicomputers and larger mainframes in a way which would permit users to enjoy the best of both worlds, according to Robert L. Ashenhurst, who is with the Institute for Computer Research at the University of Chicago.

In the past, centralization was justified by both the technological cost-effectiveness of larger vs. smaller systems and the greater efficiency with which specialized operational support service could be organized where the system was used in batch mode with a limited variety of programming language capabilities.

But applications requiring interactive or on-line processing now tend to counter this trend, Ashenhurst said in a paper prepared for the IEEE Computer Society Conference held here recently.

In a technological sense, minicomputers tailored to special needs offer a cost-effective alternative when a wide range of individual user requirements of a number of different programming languages and different modes of operation are needed.

There is also a natural propensity of users to desire a system over which they exert more, rather than less, operation control, he added.

But there are problems, too, with the exclusive use of stand-alone minicomputers. The user faces the problem of how to develop and maintain applications without the common facilities and common support group characterizing the large computing center. Turnkey systems are one answer; however, often a turnkey system is almost, but not quite, what a user needs.

Too, there may be occasional needs for expanded facilities, which could not be cost-effective incorporated into the configuration in terms of amount of use, but the absence of which leads to considerable inefficiency, he said.

The answer cited most is to connect minis to a larger system so they can be tailored to specialized applications as desired, but also make use of shared facilities as appropriate, Ashenhurst said.

With the increased flexibility and lowered costs of communications interfaces, the added cost of interconnection, it is reasoned, is more than offset by the increased capability gained.

Nature of Interface

However, there is a question of the nature of the minicomputer interface and the specifications of the hardware/software configurations appropriate to it.

It seems unlikely that merely implementing the communications needed, and otherwise configuring both the minicomputer and the general-purpose system as they would be otherwise is sufficient, Ashenhurst said.

The Institute for Computer Research is exploring the interrelationships of minicomputer/mainframe in an attempt to answer such questions as:

- Should the general-purpose system be recognized as offering a third type of service, say, on-line support, in addition to the batch and interactive services it already gives?
- How should operating system functions be distributed between the minicomputer and the general-purpose system?
- How should the capabilities for applications processing, file management and communications management be distributed and shared?

The system developed at the Institute with support from the National Science Foundation is called Minicomputer Inter-

(Continued on Page 29)

Insurance Firm Finds

Upgrades in a Series Not Always Best Choice

LOS ANGELES - Requiring more processing power, Signal Insurance Co. recently deviated from the typical pattern of upgrading from an IBM System/3 Model 10 to a larger Model 15 by installing a large minicomputer.

According to Larry B. Harvey, senior vice-president of Signal, "our new system is one of a few in the industry that just doesn't simply speed up our batch processing. It also permits us to interact directly with the system from anywhere in the company."

Signal's choice of a Hewlett-Packard 3000CX was the result of a task force study spearheaded by Harvey and the company's DP manager, Bruce Bauman.

"Our original choice," Bauman said, "was the traditional step-up to a larger System/3, the Model 15.

"The Model 15 was attractive because we thought our Model 10 programs would run on it while we were writing our new programs," he said.

But that approach, which required the use of the computer's recompile mode switch, made the computer's system console inoperative. To solve the console problem would have resulted in interim program changes and modifications to the operator control language.

The task force also decided the multiple programming capabilities of the System/3 would not be efficient for Signal's applications because of limitations in its operating system. Up to eight Signal applications will be handled concurrently on the HP 3000 vs. three on the Model 15.

If a program is too large for the HP 3000 main memory, it is segmented into logical lengths. The machine's architecture, in concert with its operating system, then manipulates the application program during execution.

Management of Signal's HP system is facilitated by the use of the mini's dual-disk system. Two 47M-byte moving-head drives, with 47 msec average access time, store the company's data base.

A fixed-head, 2.5M-byte, 8.7-msec average access disk enhances system management by providing fast transfer of programs and routines between main memory and disk storage.

The system also has two 1,600 bit/in. tape drives, a 1,250 line/min printer and 13 CRT terminals.

The Signal task force estimated the useful life of the HP 3000, in view of the company's anticipated growth and existing and contemplated programs, at five to seven years.

The company's System/3 Model 10 was installed in 1973 to absorb in-house the work of two service bureaus. "We simply emulated card procedures on a one-to-one basis," Bauman said. "Some of the programs ran well. Others ran poorly."

In addition to emulating the primary service bureau's program, subcontracting service bureau programs were converted. The latter programs, run on an IBM 360/20, processed data pertaining to four years' loss ratio carryforwards for agency experience reports. (Loss ratio is an insurance index comparing incurred losses to earned premiums, a key indicator of profitability.)

"Modifying programs became a programmatic nightmare," Bauman recalled. The task force was therefore initiated to examine all the options: a final program fix for the System/3, an upgrade and reprogram with a larger System/3 or, as was eventually decided, a switch to an independent system.

Corporate Reorganization

To ensure maximum utilization of its new system, another task force studied corporate reorganization possibilities. Several of its implemented recommendations resulted in streamlined report content and distribution.

For example, the policy services department, which maintains and updates policies, was physically removed from the underwriting department which evaluates and accepts risks. Each now receives reports confined only to its specific functions.

Another organizational change made the systems and procedures and DP departments responsible to the company's executive committee. Formerly both functions were the responsibility of the administrative services department.

Departmental interaction with the system, according to Bauman, allows decisions to be made faster and on the basis

(Continued on Page 29)

DPMA to Run New York Seminar

NEW YORK – Seminars to examine the status of minicomputers in commercial sectors will be sponsored by the Data Processing Management Association's (DPMA) New York chapter here on Oct. 23 and Nov. 20.

Titled "Minicomputers in Business – Today and Tomorrow," the programs provided by Mini-Computer Systems, Inc. will examine in detail the penetration of minicomputers in all types of users.

The programs have been developed under the direction of Walter T. Griffin, chairman of the New York chapter's Seminar Conference Committee. Griffin is assistant treasurer of The Seamen's Bank for Savings.

"We are witnessing a startling change in application of the minicomputer," Salvator Palazzo, chapter president, said.

"The minicomputer is being developed into an effective commercial tool dealing with such factors as rising costs, providing more timely and accurate information necessary for a successful business operation and generally assuring management that it is in more direct control of its DP destiny," he explained.

The Management of Mini-Computer Systems, Inc., headed by Donald L. Gross, president, and William R. Doniger, executive vice-president, will give an overview of the state of the art, emphasizing commercial usage and presenting a prognosis for near-future developments, a chapter spokesman said.

Hardware, peripherals and software in general use will be examined and there will be analysis of major commercial applications, the best methods of securing minicomputers and an analysis of financial elements.

There is a charge of $20. The chapter can be reached through P.O. Box 1406, FDR Station, 10022.



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Firm Finds Series Upgrade Not Always Best Choice

(Continued from Page 28)

of more recent data.

When evaluating new business, for example, underwriting personnel gain immediate access to current agency loss ratio reports to determine the quality of an agency relationship. Awkward, hard-copy binders, updated only quarterly, were used previously.

Edit and Audit Controls

With enlarged disk capacity, an extensive set of edit and audit controls is now employed. When entering new business, data elements are automatically checked to verify they are sensible and complete. This ensures that codes are correct and that Signal is authorized to sell the line in a particular state.

In collections, the former System/3 mode emulated traditional tub-file procedures. Pending payment cards were manually pulled from the file when checks arrived and cards were forwarded to the DP department for accounts receivable updating.

Now collections personnel directly enter cash amounts received, as accounts receivable are adjusted and audit trails established.

Applications, currently 20% cut over, will be fully converted to the HP 3000CX by the fourth quarter of this year. They include actuarial studies; agency experience records, including four-year carry-forward of loss ratios by line, branch and agency; claims; collections; accounts receivable; policy services; and general agency management.

Tab Data Entry Unit Microprocessor-Controlled

PALO ALTO, Calif. – Tab Products Co. has a microprocessor-controlled 80-column punched-card entry device called the Tab 501 data entry microprocessor.

Tab said the microprocessor incorporating an optional RS-232C interface, "gives the unit operating and interfacing capabilities unique in punched-card data entry systems."

Capable of data transmission through modem or cable, the unit can he tied into virtually any type of data entry or processing system, Tab said.

Additionally, according to the company, the 501 can read, punch, print, verify and interpret either on-line or off-line, depending on the selection of options.

Features of the 501 include up to 220 columns of constants from memory, up to 28 program levels with automatic sequencing, instant verification, automatic error correction and high-speed character duplication.

"Because of the inherent flexibility of the microprocessor, we can configure this machine to meet virtually any application requirements," Tab claimed. "In other words, we can and will actively solicit – and handle – 'specials' easily and inexpensively."

A straight keypunch with microprocessor is priced at $6,285; the RS-232C interface is $1,400; and a print/interpret function is $1,100 from the firm at 2690 Hanover St., 94304.

Combo Offers Answer To Decentralization

(Continued from Page 28)

facing Support System (Miss) and is an example of a hierarchical system.

Interaction of user-owned minis with the campus computation center facilities is channeled through an intermediate level system termed Minicomputer Operation Monitor (MOM), he said.

The existence of the intermediate level is an important component in the design philosophy – it is dedicated to the mini support function, and has file, input/output and communications monitoring capabilities only, with no provision for user applications processing, he said.

Applications are more appropriately done at either the mini or the general-purpose facility.

Functionally Specialized

The intermediate level is thus functionally specialized in the system sense, and this has implications for reliability and efficiency of the totality of support services available to the mini users, he added.

Miss users can operate minis either as terminals or as independently or dependently operating processors – most minis conveniently permit both modes to exist together (foreground/background), he explained.

Minicomputers may also be minimally configured and can be used effectively with no operating system other than the communications. software interfacing to MOM.

The system is designed so a variety of minis arc supported in a uniform way by the MOM system implemented on a medium-scale Digital Equipment Corp. PDP-11/45 configuration connected to an IBM 370/168 at the university computation center.

It is believed the Miss facility enhances the use of minis and permits applications to be easily and naturally expanded, he said. But this is done in a manner coordinated with, not independent of, the services offercd by centralized facilities.

Course on Minis Offered

NASHVILLE, Tenn. – "Minicomputers," a two-day course, will be offered on Oct: 17 to 18 at the Sarrat Student Center of Vanderbilt University here.

The course, designed to provide state-of-the-art information on minicomputer systems, is cosponsored by the Institute of Electrical and Electronics Engineers' (IEEE) Nashville section.

The lecturer is Dr. John Allen III, associate professor of mechanical engineering and computer sciences at the University of Texas.

The registration fee, which includes a copy of the course material and two luncheons, is $105 for IEEE members, $55 for IEEE student members and $125 for nonmembers.

The IEEE Educational Registrar is at 445 Hoes Lane, Piscataway, N.J. 08854.



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The author of this guide, Terry Miller, has had 15 years experience in the Federal sector working as a computer equipment analyst and as a procurement analyst in the contracting area.

While at the GSA, Mr. Miller authored many solicitation documents and reviewed RFPs submitted by other Federal agencies. He was the project officer for various mandatory requirements contract procurements including ones for tape and disk drives, plug-compatible memories and remote computing services.

Mr. Miller is the President of Government Sales Consultants, Inc., a firm that offers consulting services and seminars to computer-related companies and Government agencies seeking help in ADP procurement.

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- Pricing Strategy
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- ADP Schedules
- The Government Contracting Team
- Negotiations
- Introduction to Government Organization

New courses will be added and plans are underway to have them available in most major cities.

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Hospital Reporting System Uses NCR 399

NEW YORK – NCR Corp. has a hospital reporting system that uses a low-cost minicomputer to handle a wide range of government reporting requirements.

The Medi-Scan hospital reporting system is designed to help the nation's 8,000 hospitals meet reporting requirements generated by the government, NCR said.

The cost of the review activities, when assisted by Medi-Scan, will be "significantly under the $7 level, according to preliminary cost-comparison and cost-effectiveness studies," the company added.

Medi-Scan uses the NCR 399 and is designed for small as well as larger hospitals. The system includes five software modules which can be implemented one at a time.

The modules include a utilization review module; a medical audit, justification of admission and validation of diagnosis module; an infectious disease profile module; a tumor registry module; and a pharmacy module.

The utilization review module produces 18 daily reports and 16 monthly reports. It is designed to comply with federal standards relating to utilization review conducted on patients whose care is reimbursed by Medicare, Medicaid and other federal programs.

Among other things, utilization review reports and procedures determine whether a patient should be in the hospital and for how long, NCR said. Medi-Scan also provides daily, monthly, quarterly, semi-annual and annual reports of a hospital's utilization review program.

The utilization review module is now available for customer delivery.

The medical audit, justification of admission and validation of diagnosis module complies with medical audit requirements now required of hospitals by health care regulatory agencies and will comply with emerging federal requirements, NCR said.

DEC Adds MS800 for Offices

MAYNARD, Mass. – The System 800 from Digital Equipment Corp. has been designed for office work and is housed in a desk configuration.

The system, also known as the MS800, incorporates a PDP-8/A minicomputer and a dual floppy disk drive unit. It operates under OS/8 system software.

The MS800 features power fail/auto restart, a real timeclock and both serial and parallel I/O. A selection of DEC terminals, including the VT50 series of CRT terminals and the LA36 series of Decwriter terminal printers, is available for the system.

Designed as a stand-alone system, the MS800 can be used for decentralized data processing. The system can also be used as a remote station in a computer network.

The MS800 is available with 8K words of memory at $8,995; 16K word sells for $9,995.

Mini Measures License Hopefuls In Road Tests

HAMPTON, Va. – Prospective drivers going for road tests no longer have to fear that the tester got up on the wrong side of the bed.

Today, it's just driver against minicomputer.

The Department of Motor Vehicles (DMV) here has installed a federally funded automated driving range prototype for road tests for operators' licenses.

Built around a Data General 1200, the system relies on sensors embedded in the pavement, a transmitter and pneumatic tubes to give an objective judgment of an individual's ability to operate a motor vehicle.

The driving course is four-tenths of a mile long; six cars can be handled at one time, according to C.R. Swift, branch manager.

The DMV has six transmitters, each operating on a separate frequency. A transmitter is attached to an applicant's car before he starts the course.

As he drives, the sensors in the road react to the frequency put out by the transmitter, allowing the mini to determine which car is on what part of the course at any given time and the speed at which the vehicle is traveling.

Pneumatic signal hoses around the periphery of the course and down the center line are programmed to signal if turns are made wide, short or across the center or if driving violations were made, Swift said.

The course also includes traffic signals, stop signs and flashing lights.

The course has heen a success so far, Swift said. In the first nine months of operation, only 12% to 13% of the applicants failed the test, compared with nearly 20% for the conventional test.

The only problem encountered so far, he said, occurred when lightning struck a radio tower next to the course. The current traveled through the ground and was absorbed by the electronics, which were severely damaged.

The DMV is working on ways to alleviate this problem, Swift noted, since the tower is regularly hit.

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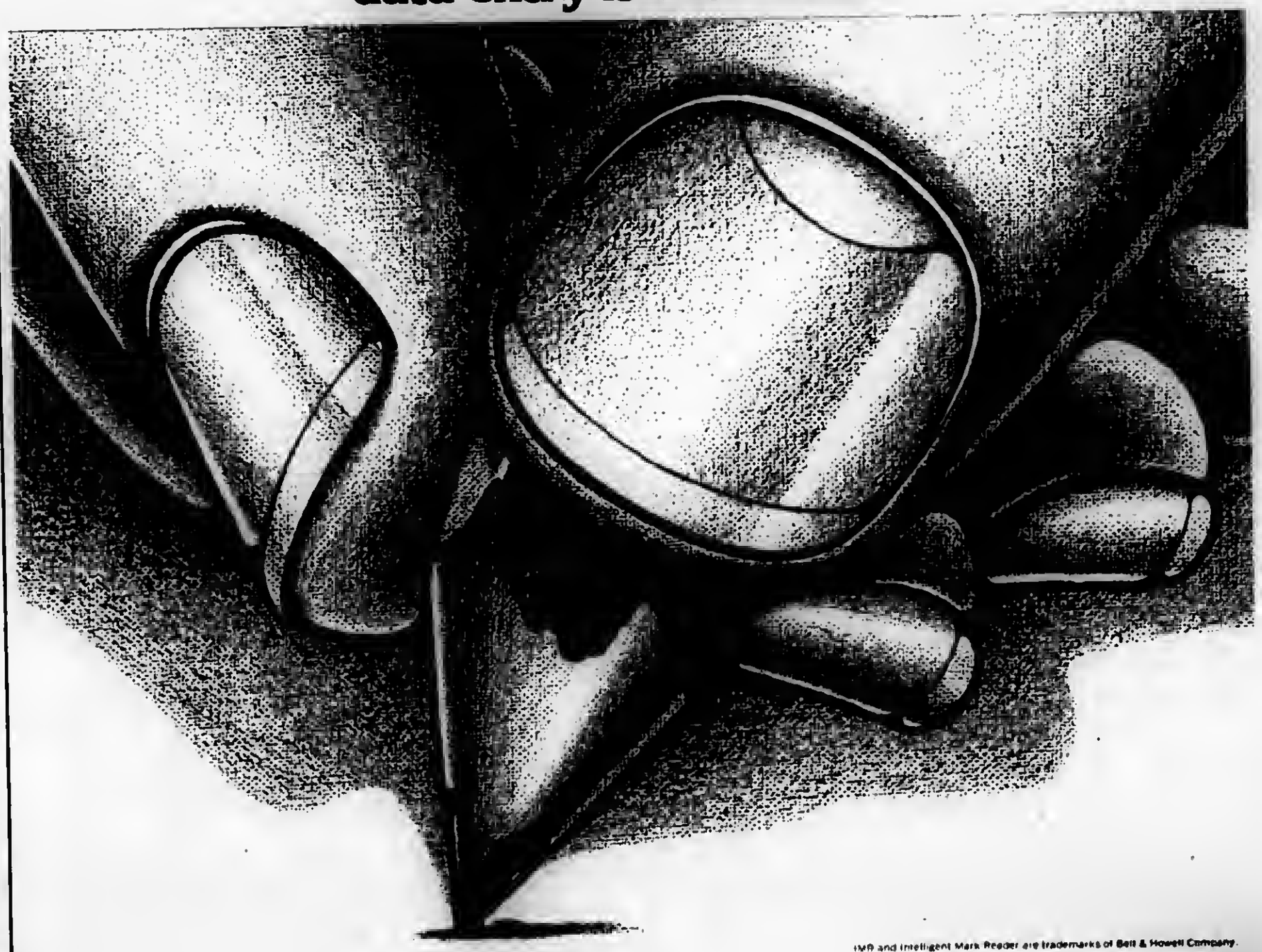
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The world of EDP is caught up in a continuous revolution. It's only 24 years since the first business computer made its appearance, and we've gone from tubes, batch processing and single site giants to multipro gramming, time sharing, data communications, giant minicomputers and hundreds of other technological innovations that were unheard of only recently. Keeping up with this revolution is difficult, to say the least. And that's why we've created the EDP Seminar Series.

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Remember, these are seminars, not lectures, and you'll be learning by doing in a shirtsleeve atmosphere. Workshops are an important feature of the Seminars, and round table discussions and shop talk luncheons complement the seminar presentations. The workbooks and course materials are yours to keep, so you'll always have a handy reference to all you've learned.

We've selected leading experts from around the country to guide each of our Seminars. They are highly accomplished specialists in their fields, experienced in presenting their techniques to industry and management. If you're involved in one of the areas shown, you should attend the EDP Seminar Series this fall. What you learn will benefit your company, your installation, and you.

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems Their performance, evaluation, measurement, and improvement* will lead this two day seminar on measurement techniques designed to save your installation money. As well as system performance at your own instal lation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

Wash., D.C.	**Marriott at Wash. Int'l. Airport**	**Oct. 20-21**
Chicago	**Hyatt Regency O'Hare**	**Oct. 27-28**
San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incor porate visible outputs into the software develop ment cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming, Top-down analysis, design, implementation, and Chief Programmer teams. Cost for the entire seminar, including continen tal breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

New York	**St. Moritz**	**Oct. 6-7**
San Francisco	**Berkeley Marriott**	**Nov. 10-11**

Data Base Design

Given in association with Leo J. Cohen and Performance Development Corporation, this three day seminar is a package independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimum File Organization/Indexing Techniques, File Integration, and much more.

Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300.

Denver	**Denver Hilton**	**Dec. 1-3**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½ day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of dis putes, Security, Fraud, Taxation, and Tech niques for handling any transaction. Cost for the entire seminar, including continental break fasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

New York	**Summit Hotel**	**Oct. 22-24**
San Francisco	**Hyatt Regency San Francisco**	**Nov. 12-14**
Chicago	**Hyatt Regency O'Hare**	**Nov. 19-21**

Data Communications Course #1010 – Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental break fasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

New York	**St. Moritz**	**Oct. 13-14**
San Francisco	**Dunfey's Royal Coach**	**Oct. 20-21**
Dallas	**Hilton Inn**	**Nov. 10-11**
Miami	**Marriott Miami Beach**	**Nov. 17-18**

Data Communications Course #1020 – Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications net works. This three day seminar covers pro cedures, approaches, and algorithms for eval uating and cost optimizing network operations. Total cost, including an extensive set of custom ized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Miami	**Holiday Inn Airport Lakes**	**Dec. 1-3**

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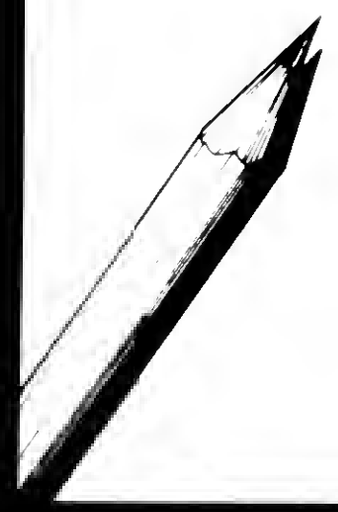
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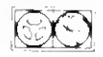


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CI Notes

McGurk to Run for Congress

LOS ANGELES Dan L. McGurk, who until May of this year was president of the Computer Industry Association (CIA), will run as a Republican for the congressional seat now occupied by Barry Goldwater Jr. (R-Calif.).

Goldwater, a conservative who has become identified with regulating the collection of personal information by both government and business, will challenge Sen. John V. Tunney, a Democrat, for his Senate seat in 1976, it has been reported.

Lee Stitzenberger resigned his post as CIA assistant director a few weeks ago to become McGurk's campaign manager, CIA President Jack Biddle confirmed.

McGurk, who joined Scientific Data Systems in 1964 as vice-president of marketing, became president and chief operating officer of the firm in December 1969, when it became Xerox Data Systems (XDS).

He left XDS in October 1970 and went into consulting. In July 1972, he became the first CIA president.

A West Point graduate and Rhodes Scholar, McGurk also holds a B.A. and M.A. in economics, political science and philosophy from Oxford University.

Pertec-CMC Merger On Again

LOS ANGELES Pertec Corp. and Computer Machinery Corp. (CMC) of Marina Del Rey have signed a letter of intent to merge.

According to the agreement, Pertec will swap 1.8 million of its shares, valued at about $8 million, for all of CMC's shares of common stock, which amount to $5.2 million.

Before the deal goes through, CMC's business and financial condition must be audited, its bank loan restructured and approval must be voted by stockholders of both firms.

Earlier merger discussions were terminated Aug. 27 but, according to a Pertec spokesman, "recent developments made it appropriate to reevaluate the positions taken by both companies."

CMC reported a first-half loss of $802,000, although last year's revenues were $55 million. Pertec reported revenues of $48 million in 1974.

Judge Upholds IBM Trial Schedule

LOS ANGELES Judge Ray W. McNichols has upheld the trial schedule of plaintiffs whose cases against IBM were consolidated for pretrial purposes.

McNichols also said he stands by his recommendations to a multidistrict panel that the Sanders case be remanded to New Hampshire.

McNichols granted IBM permission to conduct further discovery regarding Forro Precision, Inc., which has admitted destroying "copies" of documents since the pretrial hearings.

This is a potentially serious matter, or it could be nothing, an IBM attorney observed.

In upholding the trial schedule, McNichols added that if something occurs that would make a serious change in the timetable, he would reconsider the schedule.

The next hearing is scheduled here Oct. 28.

Amdahl Eyes Government Business

WASHINGTON, D.C. Amdahl Corp. has announced the opening of a regional sales and service office here to bring word of its 470V/6 computer system to potential users in the area, principally government agencies.

The office is at 5454 Wisconsin Ave., 20015.

Plan Software Modifications

T/S Firms See 5100 Boosting Business

By Molly Upton
Of the CW Staff

Time-sharing firms generally think IBM's recently introduced 5100 will increase their business, and several have announced plans to modify their software for use on the system.

A *Computerworld* survey of seven time-sharing firms offering APL and/or Basic found four expecting an increase in business as a result of IBM sales of 5100s.

Two firms said they foresee no change, while one indicated a decline is possible.

The majority of firms said most of their customers require the facilities of large systems, such as data bases, which they said the 5100 would not replace.

I.P. Sharpe Associates, Time-Sharing Resources, Inc. and Computer Sharing Services, Inc. indicated they are thinking of tailoring some of their existing APL software for the 5100.

The 5100 includes Basic and APL interpreters, a communications capability and up to 64K bytes of main storage [CW, Sept. 17].

Sharpe, Time-Sharing Resources, and another firm, APL Services, Inc. foresee linking the 5100 to their systems, which should expand their customer bases, they said.

"The net effect will be positive for Sharpe," Josef Schengili, director of marketing, said.

"Although there will be some work done on our system that will be transferred to the 5100, on the other hand I see a certain number of applications that will now become viable with the 5100 and communications to a large computer and data bases," he explained.

These new applications include order entry preprocessed on the 5100, stored on its cartridge and then sent to the time-sharing computer, Schengili said. This would eliminate many of the line charges, he observed.

Sharpe is recommending the 5100 to some clients because it could save them some money, he added.

'Excellent Extension'

Joel Weisenfeld, vice-president of marketing for Time-Sharing Resources, said his firm has already decided to lease a 5100.

"We feel it is an excellent extension of our time-sharing services. The IBM unit can benefit our present customers as well as a new audience we couldn't service well previously," he said.

Typical of the new market he sees evolving are certified public accounts, who want applications such as accounts receivable and payable that were previously unfeasible to do on-line.

With IBM figuring to sell 10,000 units by the end of this year, the 5100 should build a need for APL, Weisenfeld said. When these initial customers outgrow the 5100, they will become time-sharing users, he commented.

Time-Sharing Resources, based in Great Neck, N.Y., specializes in financial modeling, inventory control and statistics; about 80% of its customers are large companies.

Speaking of the possibility of offering packages for the 5100, Weisenfeld said, "APL is our business. Wherever we can lend support for it, we intend to."

(Continued on Page 34)

Univac to Spend Coming Months Mulling Takeover of Xerox Base

By Nancy French
Of the CW Staff

BLUE BELL, Pa. Univac said it is considering taking over Xerox Corp.'s Data Systems Division base of leased and purchased equipment in both the U.S. and abroad and will announce a final decision in 30 to 60 days.

In a statement issued over the Dow Jones wire, Univac said the firm was "reviewing the feasibility and economics of Sperry Univac's assumption of the obligations to service, maintain and support the Xerox Data Systems' customer base. It is too early to forecast the outcome of this review."

A Xerox spokesman said the firm could make no comment "in the middle of the negotiations."

While industry sources point out Univac and Xerox equipment have no particular architectural affinity, one said the two manufacturers did tend to go after the same customers — the more technical users — and "it could be a nice fit."

With 10% of the market share, Univac is the second largest computer mainframe company after IBM and the "most logical" computer mainframer to take on the Xerox user base, several different industry sources noted.

Success With RCA Base

Although a Univac spokesman protested it is "far too early to say whether the firm would attempt to integrate Xerox users into an upward migration to Univac gear," Univac has been quite successful with the RCA user base it acquired on Jan. 1, 1972.

Of 500 original RCA users, 10% have installed or have ordered Univac mainframes. Of these new Univac mainframe users — customers Univac never would have gotten any other way, the spokesman agreed — 32% chose systems in the 1100 series. The remaining 68% chose 9000 or 90 series equipment.

In addition, the firm has delivered a variety of tapes and disks for use on their users' Series 70 equipment, he said.

Purchased three and one half years ago for $120 million, the RCA user base is still bringing in about $5 million/mo in equipment rental, according to estimates maintained by James Peacock, editor of *EDP Industry Report*.

Market Share Boost

The RCA user base increased Univac's market share from an estimated 5% or 6% to about 10%.

Acquiring the Xerox data base, estimated by industry sources at about 1,200 mainframes, could boost that share another percentage point. Peacock speculated that, while the two are dissimilar architecturally, Univac's 1100 series or even the Series 90 could offer Xerox users a logical upgrade route.

Perhaps Univac officials see a link between Xerox users and the new equipment scheduled for announcement in Minneapolis this week, one source suggested.

At any rate, Univac appears to be in a rather strong negotiating position — if only by default, he added.

Several other firms have "talked" with Xerox about such an acquisition, and at least one Hewlett-Packard has announced it isn't interested.

Out of Work, But Not Hurting

By a CW Staff Writer

EL SEGUNDO, Calif. Xerox Data Systems Division employees out of jobs as a result of the company's decision to bow out of the mainframe business [CW, Sept. 17] have begun receiving what may be the most handsome severance benefits yet heard of in the computer industry.

Rather than receiving a lump-sum severance check with their pink slips, employees are being placed on "salary continuation."

"Salary continuation is just like being on the payroll in terms of benefits," a Xerox spokesman explained. "The employee gets the same income and the same health insurance benefits, for example. The only difference is he has no duties" and does not have to report for work.

The only responsibility a person on salary continuation has is to report in when he gets another job. At that time his salary is terminated.

Based on Age, Length of Service

Duration of salary continuation is based on age as well as length of service, assuming the older the employee, the more difficulty he will have finding another job.

Employees with four years' service who are less than 40 years old are receiving salary continuation for four months. Four years' service assures the employee between 40 and 50 years old of six months' continued salary and those between 50 and 60 with eight months' salary.

For service of at least one year but less than four, the employee under 40 is receiving two months' salary continuation.

The same length of service is earning the employee from 40 to 50 years of age three months' salary and the employee over 50, four months' salary continuation.

Employees with the company eight years or more are receiving six, nine and 12 months's salary continuation if they are under 40, between 40 and 50 or over 50, respectively.

As for how the firm ensures an employee doesn't try to continue receiving his Xerox salary at the same time he is employed elsewhere, the spokesman explained, "we think employees appreciate the benefits of the program and are willing to comply with its terms."

No Loss in Seniority

If business changes in a year or so, and an employee returns to Xerox Corp., he will lose none of his seniority with the firm, he explained.

"If a person has always longed for some change of life-style and wanted the breathing room and economic freedom to do it, there it is," the spokesman said. On the other hand, he added, it's not pleasant to be looking for a job in a recession.

The placement office set up in the Imperial Bank building here to help laid-off employees find other jobs has received many calls from potential employers nationwide, he said. However, no figures are yet available to indicate how successful it has been.

With 4006-1 Terminal

Tektronix Aiming at First-Time Graphics Users

SAN FRANCISCO — With the introduction here of the 4006-1 graphics terminal, Tektronix, Inc. has given its recently reorganized end-user and OEM divisions ammunition to expand their markets to first-time graphics users.

Tektronix' traditional market areas have been the innovators, scientists and engineers, explained Howard Mikesell, general manager of the Information Display Products Division, an end-user marketing unit.

Now, with the 4006-1, which sells for $2,995, about $1,000 less than the firm's previous bottom-of-the-line product, Mikesell intends to introduce graphics capability to people such as corporate management, the educational market and manufacturing, he said.

A key element of Tektronix' move toward the first-time graphics user is the Interactive Graphing package, designed to allow the user to create graphics in plain English. The package sells for $1,000 and is also usable on the firm's other terminals, Mikesell said.

The price of the 4006-1 allows Tektronix to aim it at the high end of the alphanumeric market, Mikesell commented. "The user can almost have graphics for free," he said.

Tektronix also unveiled its 4923 digital cartridge tape reader, which sells for $1,895. The firm made the drive mechanism to handle the 3M Co. cartridge, he said, noting this is one of its first vertical integration efforts.

In the past, the firm often has not made the exact product the OEM wanted, he said. "We did not address or serve the market as it deserved," he added.

OEM Division

The Information Display OEM Division, headed by Jon Reed, was created so the firm could remedy that problem, Mikesell said.

Tektronix OEM business in the past year has been declining, which Mikesell attributed to the economy. However, he added, it has begun to pick up sharply.

Increasing OEM business means getting more Tektronix direct-view storage tubes out in the marketplace, he said, explaining increased exposure of its screen is expected to mean increased demand.

In addition, marketing to OEMs enables Tektronix to reach markets it would not sell to directly, he said.

The direct-view storage tube has no buffer to refresh and allows the use of graphics with a smaller memory allotment than if the screen were refreshed, a spokesman said.

User Division

Another division formed as a result of the recent reorganization is the Information Display Systems Division, to address the user who needs systems integration and support, Mikesell explained.

The Information Products Group in 1975 had sales of $48.8 million, about 15% of Tektronix' revenues and a 108% improvement over the year before.

In October the group will consolidate its activity in a new building in Wilsonville, Ore., replacing about six separate locations.

Since Tektronix introduced its first graphics terminal in 1970, the 4002A for $10,000, it has been striving to show and convince users of benefits of graphics. Now users and the competition are convinced, Mikesell said.

In 1970, before Tektronix entered the field, a graphics terminal cost about $50,000, he said.

Adapso Sets Topics

SAN DIEGO — The annual meeting of the Association of Data Processing Service Organizations (Adapso) here next month will highlight changes in the marketplace and in technology itself, especially the challenges presented by the mini and microcomputer; views for capital opportunities; and the development of computer people.

Scheduled for Oct. 21-24 at the Sheraton Harbor Island Hotel, the conference has been formatted to provide general sessions of broad appeal coupled with concurrent sessions tailored to the specific needs of Adapso members in the data center section, the software industry association and the remote-processing services section.

For additional information and registration forms, contact Adapso at 210 Summit Ave., Montvale, N.J. 07645.

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IBM 5100 Will Boost Business

(Continued from Page 33)

Scientific Time Sharing of Bethesda, Md., also plans to offer software for the 5100.

Dan Dyer, the firm's president, explained most people would probably get the APL option because it only cost $2,000.

Once they get through the first 10 pages in the APL handbook, the use of APL will "take off. There is no doubt which language people will prefer once they've tried both," he said.

After developing a few "personal applications, they will reach a level where they have confidence in using APL for major applications," he added. Dyer has already placed his order for a 5100.

Positive Integration

Joel Lamb, president of APL Services in Trenton, N.J., remarked that, although he has not yet seen the 5100, he expects to integrate it in a positive manner.

"It might open up a whole new market," of users who could perform most processing on the 5100 but would occasionally need a data base, he said.

The 5100 should not detract from APL Services' customer base, he said, which is now generally composed of network-oriented companies and those needing data base capabilities, such as airlines and financial institutions.

As Lamb sees the 5100, its principal market should be the individual engineer-type problem solver.

If the 5100 had come out three years ago, Lamb would have reacted differently, he observed, because APL Services was then more oriented toward the individual user.

"Our move toward larger users was not clairvoyance on our part, but the result of demands of the marketplace," he said. In addition, "most of our users depend on unique aspects we've incorporated into APL," Lamb added.

No Impact at All

Thomas O'Rourke, president of Tymshare, said he sees no impact on his business, which consists of larger firms using data bases and more sophisticated software tools such as forecasting.

The time-sharing market for the single engineer "pretty well dried up in the early '70s" and was heavily invaded by minicomputers, he said.

HDR Systems, Inc. of Omaha, Neb., could experience a net loss as a result of the 5100, according to Robert Gustafson, manager of marketing.

HDR serves both high schools and universities, he explained, although most of its business is in the commercial sector. Doing some mental calculations, he surmised the basic Model 5100 could be leased on a third-party basis at around $250/mo, which is approximately the same as HDR's port and terminal charges.

For "quick and dirty" learnings of Basic in the education market, the cost per month might be close, he said. The empirical math customers, however, will stay with time-sharing, he predicted.

Computer Sharing Services of Denver is not worried at the moment about the 5100, Bud O'Leary, marketing manager, said.

The 5100 could possibly impact its customers that do not have large core requirements, he observed, but time-sharing users are generally tending to use the core available.

Theoretical engineers comprise a maximum of 25% of his firm's business, he said, adding most of the business is in Basic rather than APL.

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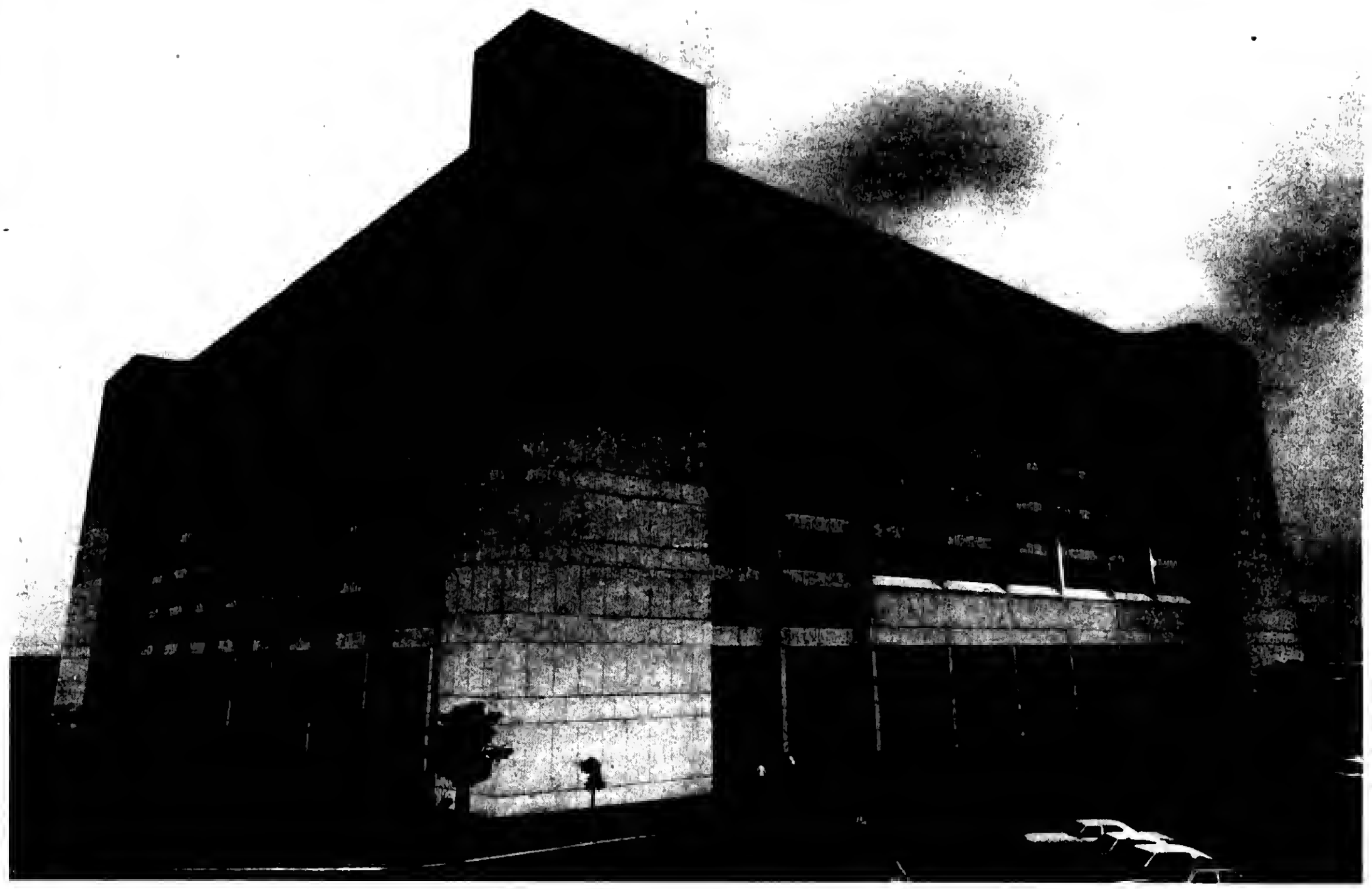
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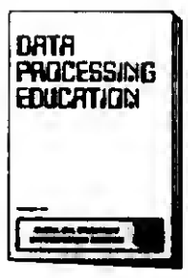
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Age of 'Build-It-Yourself' Micros Arrives at Wescon

By Molly Upton
Of the CW Staff

SAN FRANCISCO The age of the "build-it-yourself" microcomputer appears to be here.

Not only did more than 800 people attend the session entitled "Microcomputers How Do I Get Started" at the Western Electronic Show and Convention (Wescon) here recently, but several booths offering everything from a $20 microprocessor chip to microcomputer kits were besieged with inquiries.

The California silicon houses were conspicuous in their absence from the floor, although a couple of distributors were attempting to field questions.

MOS Technology, Inc. set the pace with its $20, 8-bit MCS6501, which is compatible with Motorola's 6800, the firm said.

The firm offers five microprocessors, all of which are software-compatible with one another.

For $25, one can buy the MCS6502, which has an on-board clock. Both units are 40 pins

MOS Technology has been making chips for calculators and is interested in selling to the individual experimenter as well as OEMs, according to Jerry Holdt, product manager. The firm is at 950 Rittenhouse Road, Norristown, Pa. 19401.

Jolt With RAM

For those who might want more than a single processor chip, Microcomputer Associates, Inc. uses MOS Technology's chip in a kit called Jolt which sells for $249.

The kit includes a static memory accommodating 512 bytes of user random-access memory (RAM) and a teletype-writer or EIA interface, along with Debugger/Monitor (Demon) software, the firm said.

The kit also has 16 programmable input/output lines. Assembly can be completed within three hours, the firm said.



CW Photo by M. Upton

General Instrument Corp. opened the door on its Gemini micro.

A card with 4K RAM costs $265 unassembled. Microcomputer Associates has other kits for I/O, power supply universal cards and accessories, The firm is at 111 Main St., Los Altos, Calif, 94022.

Mostek sells its F8 kit for $297 including an 8-bit processor, a read-only memory (ROM) and a printed circuit board. The user supplies resistors and capacitors.

Mostek is at 1215 W. Crosby Road, Carrollton, Texas 75006.

General Instrument Corp. showed a prototype of its Gemini microcomputer that has 8K RAM and sells for $3,500. It can handle up to 65K, according to the firm, which added it expects to market the unit in process control and instrumentation environments.

Data I/O is bringing out a portable program duplicator for programmable read-only memories (Prom) and an emulator which looks like a hand-held calculator.

The two units will sell for a combined price of about $1,000, Dick Woods, area manager, said.

Single-Chip Micro Available to Market

SAN FRANCISCO – General Instrument Corp. has begun taking orders for its CP-1600, which it hailed as the first single-chip, N-channel 16-bit microprocessor.

The 40-pin unit sells for $99 in single quantities and for $40 in quantities of 100.

The chip uses eight 16-bit registers.

Although the firm announced the chip last February, it previously was committed to selling it only to Honeywell for use in process control applications, according to Frank G. Hickey, president.

General Instrument plans to introduce a programmable interface-controller chip in January.

Software support for the CP-1600 will include on-line debug test equipment, simulators, assemblers and reloading linking loaders as well as utility programs, Hickey said.

The firm also plans to make available a library of application subroutines and a language generation package.

General Instrument Microelectronics is at 600 W. John St., Hicksville, N.Y. 11802.

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U.S. firm in joint venture to set up data processing facility in the Kingdom of Saudi Arabia. Individual must have thorough knowledge of banking applications including on-line systems and have a knowledge of IBM oriented banking software. In addition, individual should have management experience and the ability to communicate and work well with others.

This is a top management position, with excellent salary and benefits package. Transportation provided. Family housing included. Significant tax advantages.

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BASIC RESPONSIBILITIES:
Individual will be responsible for managing a DEC-10 system and for developing information services to serva the County Administration.
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B.A. with emphasis in Data Processing, minimum of three years of experience with business systems design, a knowledge of data basa techniques, experience with both interactive and batch processing. Experience with DEC-10 hardware, and experience with management of personnel, is desirable.
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APPLY AT:
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You will design learner centered curric: a for new herdware systems end products. Tasks include perlormence and skill enalyses; performance eid dasign; curriculum design, documentation and valideticn; end training program presentation and administration. Experience in hardware systems maintanance, systems programming, technicel writing, end educational technology is desireble.

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SOFTWARE

These positions require instructionel experience in dete communication as well as experienca in FORTRAN or MACRO programming. Oparating systems experience is desireble. In addition to teaching, you will also contribute to course davelopment.

HARDWARE

You should have teaching experience on small end medium scale general purposa computers end peripherels. Data communication experience is desirabla. In addition, you should be able to conduct ongoing course devalopment efforts in the erae of studant and lab guides, lasson plens, training eids end tests.

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INSIDE INFO

FOR COMPUTER PROFESSIONALS

Comprehensive information, not generally available, is essential to the careful evaluation of en employment opportunity.
How cen you get this vital date? Simply contact the Netional Computer Associates office nearest to you. They have had long end intimate contact with EDP employers. So they have e totel understanding of ell the things you'll need to know.
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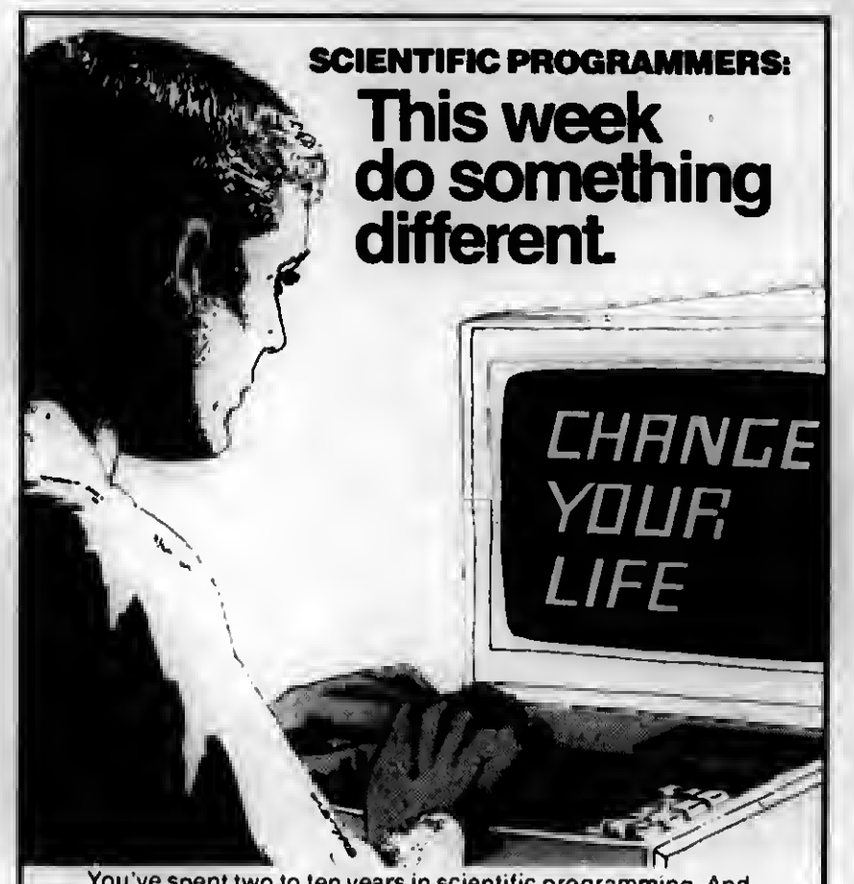
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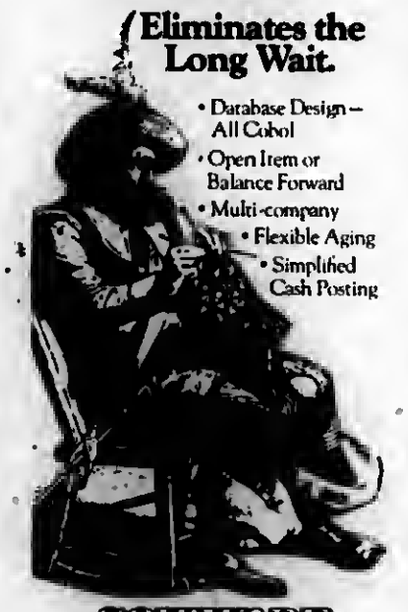
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Kenneth G. Hayes
Project Director
Systems Planning Division
Blue Shield of Messachusetts, Incorporated
Post Office Box 2187
Boston, Massachusetts 02106

Information regarding this procurement can be obteined by celling Mr. Hayes at (617) 357-8519.
Separate technical and price proposals are required on or before 10 a.m. E.S.T., December 1, 1975

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Decline Expected

On-Line Systems Quarter Income Down

PITTSBURGH, Pa. – On-Line Systems, Inc. reported financial performance for the three months ended July 31 was down from the year-ago period.

Net earnings of $59,000 or 7 cents a share for the company's first 1975 quarter were down from the $427,000 or 51 cents a share posted in the same year-ago period.

The decline was anticipated as early as March in a letter to stockholders in which the firm attributed poor performance to a temporary dip in government contract revenue, a spokesman said.

Last year's earnings were greatly increased by a short-term contract with the Federal Energy Administration, a spokesman said.

That contract has since expired and, although the firm said it has signed a "sizable" pact with the Department of Health, Education and Welfare's Office of Education, revenues will not affect first-quarter earnings.

On-Line Systems posted revenues for the quarter at $2.2 million compared with $2.9 million in the same year-ago period.

Graham '75 Profit Margin Narrowed; Increase in Materials Cost Cited

GRAHAM, Texas – Increased costs of materials were significant factors in narrowing Graham Magnetics, Inc.'s 1975 profit margin, President G.A. Jaggers said.

Earnings for the year dipped to $1.2 million or $1.33 a share from the record high of $1.4 million or $1.46 a share in 1974.

Revenues rose to $15.8 million from $15.3 million in 1974.

Management was gratified the company "succeeded in maintaining sales volume in spite of the sharp downturn in the economy" in fiscal 1975, Jaggers said.

Profit from operations exceeded that of any year besides 1974, he added.

Tektronix Reaps 8% Earnings Rise

BEAVERTON, Ore. – Tektronix, Inc. has announced an 8% increase in first-quarter earnings compared with the same quarter a year ago.

Earnings for the first quarter ended Aug. 23 were $5.76 million compared with $5.31 million a year ago or 66 cents a share, up from 61 cents a share last year.

Sales increased 3% to $74.8 million from $72.8 million a year ago.

MDS, Holder of Note Settle Default Claim

PARSIPPANY, N.J. – Mohawk Data Sciences Corp. (MDS) said it has reached a tentative settlement with the holder of a $10 million note which had claimed MDS was in default.

Substitute Notes

Under the proposed agreement, MDS will substitute a new set of notes to Source Capital, Inc., one for $6.5 million due in 1982 and one for $3.5 million due in 1984.

Approval is required from MDS' banks because the agreement gives the $6.5 million note equal status with a $100 million revolving-credit agreement with the banks. MDS said it expects approval soon.

Contracts

Stansaab Elektronik AB has received a contract from the Polish State enterprises PHZ Metronex and ZUK Mera-Elzab to provide production equipment and technical know-how for manufacture of the Alfaskop data terminal system.

Access Corp. has been awarded a contract by the U.S. Army for the automation of all active-duty army personnel records. The system will utilize updateable microfiche technology to simplify record retrieval.

Carterfone Communications Corp. has received an installation and peripheral equipment maintenance contract from Transamcrica Computer Co. covering about 600 key-to-tape data stations owned by Transamerica.

Financial Industry Systems has received a three-year resource management contract from Middlesex Mutual Assurance Co. to manage DP systems and operations.

Interdata, Inc. has receivcd a $300,000 follow-on contract from Cybermed Corp. for Interdata 7/16 and 7/32 minicomputers to be used in hospital laboratory systems.

Datum Data Acquisition Division has been awarded a $1.1 million contract to provide a complete turnkey data acquisition syatem for the U.S. Air Force, to be used for rocket propulsion testing.

Leasco Software, Ltd. has been awarded a $4 million contract from British Steel Corp. to design and develop software for a telecommunications network which will link British Steel's plants, offices and computer bureaus throughout the UK.

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Earnings Reports

CENTRAL DATA SYSTEMS
Year Ended May 31

	1975	1974
Shr Ernd	$1.00	$.82
Revenue	10,170,507	8,985,315
Earnings	461,482	377,197

COMPUTERVISION
Three Months Ended June 30

	1975	1974
Shr Ernd	.....	$.25
Revenue	$5,607,000	6,794,000
Earnings	(146,000)	580,000
6 Mo Shr	.....	.47
Revenue	10,276,000	12,325,000
Earnings	(325,000)	1,080,000

SANDERS ASSOCIATES
Year Ended July 25

	1975 (000)	1974 (000)
Shr Ernd	$3.27	.....
Revenue	180,936	162,288
Spec Cred	a13,411	.....
Earnings	14,945	(19,067)
3 Mo Shr	.12	.....
Revenue	51,601	41,741
Spec Item	e189	b(1,146)
Earnings	546	d21,990

e-From tax-loss carryforward and $7.9 million gain from exchange of debentures. b-Reversal of tax-loss carryforward. d-Includes charge of $19.2 million from accounting change for lease acquisition and other costs and charge of $4.8 million to adjust certain inventories to net realizable value.

T-BAR
Three Months Ended June 30

	1975	e1974
Shr Ernd	$.18	b$.12
Revenue	1,205,810	930,246
Earnings	74,878	49,596
6 Mo Shr	.35	b.21
Revenue	2,307,910	1,747,446
Earnings	147,947	87,568

a-Restated. b-Adjusted for 5% stock dividend paid in April 1975.

TRACOR
Three Months Ended June 30

	1975	e1974
Shr Ernd	$.59	$.46
Revenue	26,181,000	23,982,000
Disc Op	.....	(25,000)
Tax Cred	755,000	553,000
Earnings	1,460,000	1,114,000
6 Mo Shr	1.05	.83
Revenue	49,176,000	44,635,000
Disc Op	.....	(8,000)
Tax Cred	1,283,000	954,000
Earnings	2,583,000	2,018,000

e-Restated.

ELECTRONIC ASSOCIATES
Three Months Ended July 4

	1975	e1974
Shr Ernd	$.04	$.03
Revenue	8,499,000	9,013,000
Disc Op	.....	(311,000)
Tax Cred	15,000	.....
Earnings	98,000	74,000
6 Mo Shr	.20	.....
Revenue	15,390,000	15,244,000
Disc Op	.....	(433,000)
Tax Cred	236,000	.....
Earnings	525,000	(186,000)

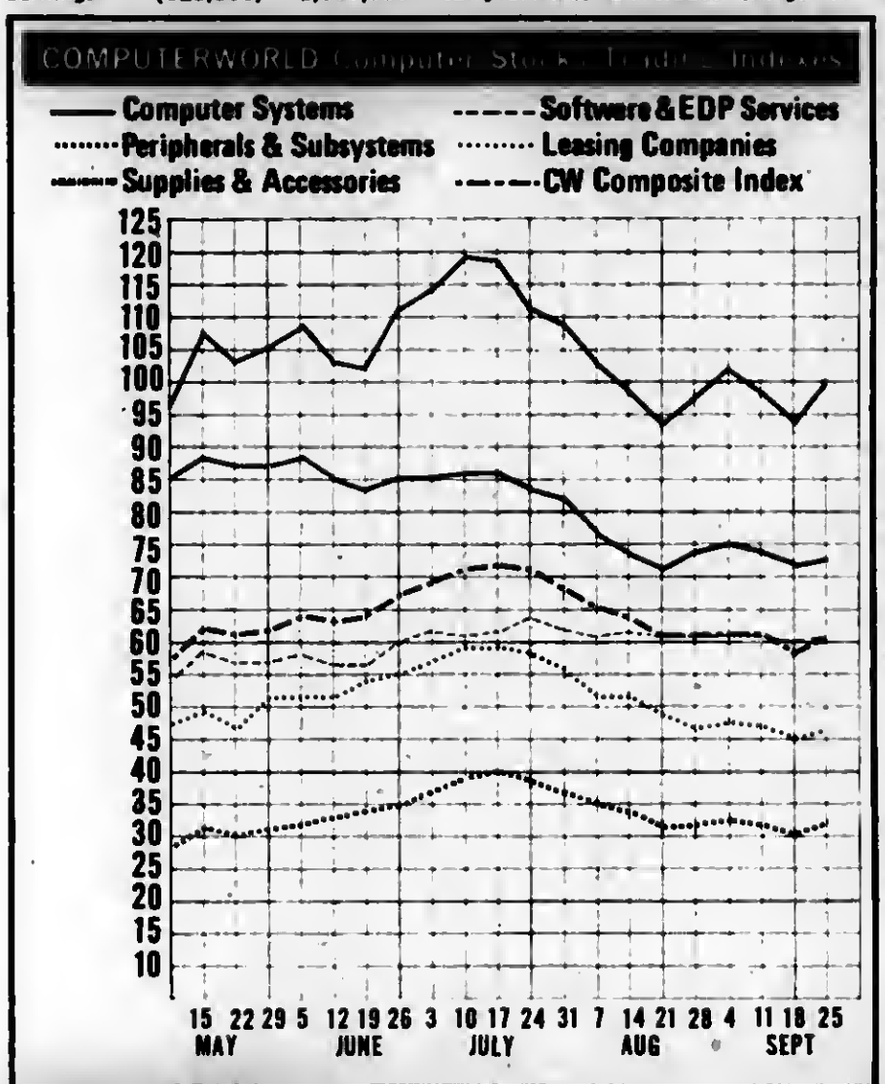
a-Restated to reflect discontinued operations.

COMPUTER AUTOMATION
Year Ended June 29

	1975	1974
Shr Ernd	$.70	$1.13
Revenue	21,372,000	19,653,000
Earnings	1,185,000	1,894,000
3 Mo Shr	.22	.33
Revenue	5,761,000	5,893,000
Earnings	392,000	555,000

COMPUTER INSTALLATIONS
Three Months Ended March 31

	1975	1974
Shr Ernd	$.03	$.03
Revenue	341,155	264,664
Earnings	27,254	21,898



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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 24, 1975

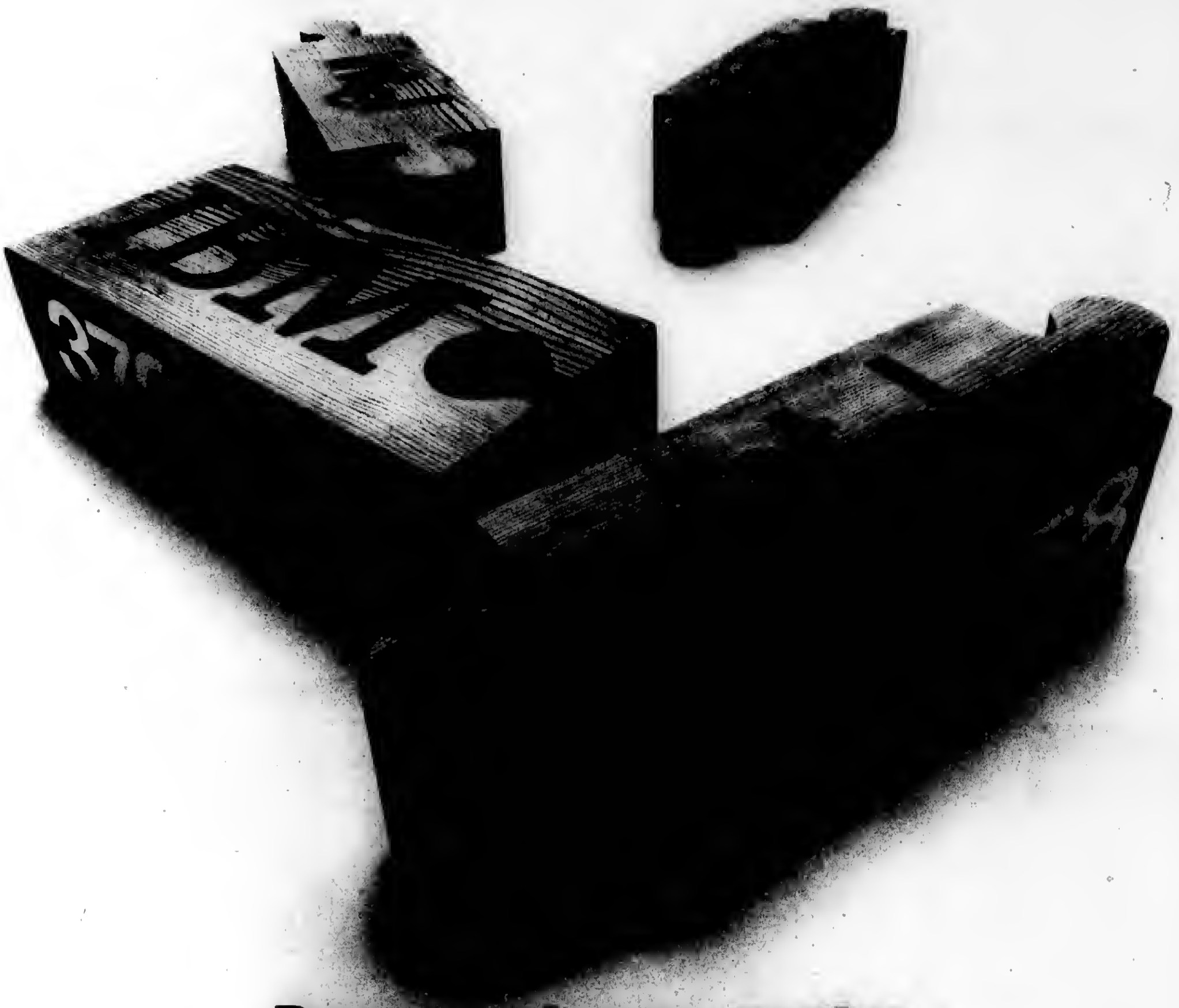
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 PRICE RANGE (1)	CLOSE SEP 24 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	89 3/4	+5 3/8	+6.3
O	COMPUTER AUTOMATION	2- 10	9 3/4	+ 7/8	+9.8
N	CONTROL DATA CORP	11- 23	16 3/8	+1	+6.5
N	DATA GENERAL CORP	10- 38	31	+4 3/4	+18.0
O	DATAPOINT CORP	6- 26	21 1/4	+2 3/4	+14.8
O	DIGITAL COMM CONTROL	1- 4	2 1/2	0	0.0
N	DIGITAL EQUIPMENT	46-122	119 3/4	+11 1/4	+10.3
N	ELECTRONIC ASSOC.	2- 3	2 3/4	+ 3/8	+15.7
A	ELECTRONIC ENGINEER.	5- 10	8 5/8	+ 3/8	+4.5
N	FOXBORO	23- 42	26 1/4	+1	+3.9
O	GENERAL AUTOMATION	6- 14	6 3/4	0	0.0
C	GRI COMPUTER CORP	1- 1	1/2	- 1/8	-20.0
N	HEWLETT-PACKARD CO	58-120	96 5/8	+5 5/8	+6.1
N	HONEYWELL INC	22- 40	28 7/8	+1 1/4	+4.5
N	IBM	158-224	191	+11 1/4	+6.2
O	NEWBREK	1- 10	7 1/8	+ 1/4	+3.6
C	NICRODATA CORP	2- 6	5 5/8	+ 5/8	+12.5
O	NORDLAB COMPUTER SYS	5- 19	13 1/2	+1 3/4	+14.8
N	NCR	15- 39	25 1/2	- 1/4	-0.9
O	PRIME COMPUTER INC	2- 6	4 3/4	0	0.0
N	PERKIN-ELMER	16- 30	22 7/8	- 1/4	-1.0
N	RAYTHEON CO	26- 59	54 1/2	+5 3/4	+11.7
N	SINGER COMPANY	10- 17	11 1/2	- 1/4	-2.1
N	SPERRY RAND	26- 49	40 1/4	+4 1/2	+12.5
A	SYSTEMS ENG. LABS	1- 5	3 3/8	+ 1/4	+8.0
O	ULTIMATE SYSTEMS INC	1- 6	5 5/8	0	0.0
N	VARIAN ASSOCIATES	7- 18	14 3/4	+1 7/8	+14.5
N	WANG LABS.	7- 17	11	+1 5/8	+17.3
N	XEROX CORP	51- 86	54	+1	+1.9
	LEASING COMPANIES				
O	CONDISCO INC	1- 5	3 5/8	+ 1/4	+7.4
A	COMMERCE GROUP CORP	2- 4	2 5/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	5/8	+ 1/8	+37.5
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	OCL INC	1- 1	1/2	0	0.0
N	OPE INC	3- 6	4 3/4	0	0.0
O	EGR RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/8	0	0.0
A	GREYHOUND COMPUTER	2- 3	3	+ 1/2	+20.0
A	ITEL	3- 9	6 1/2	+ 1/2	+8.3
N	LEASCO CORP	4- 8	6 3/8	+ 7/8	+15.9
O	LEASRAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
C	NRG INC	0- 4	3/4	- 7/8	-53.8
A	PIONEER TEX CORP	2- 7	5	0	0.0
A	ROCKWOOD COMPUTER	1- 1	1/4	0	0.0
N	U.S. LEASING	7- 14	7 1/4	+ 1/4	+3.5

EXCH		1975 PRICE RANGE (1)	CLOSE SEP 24 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	7/8	- 1/8	-12.5
A	APPLIED DATA RES.	1- 10	1 3/4	+ 1/8	+7.6
N	AUTOMATIC DATA PROC	29- 65	50	+4 1/4	+9.7
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	CENTRAL DATA SYSTEMS	3- 7	7 1/8	+ 1/2	+7.5
O	COMPUTER DIMENSIONS	2- 6	3	- 3/4	-20.0
O	COMP ELECTION SYSTMS	3- 6	5	- 1/4	-4.7
C	COMPUTER HORIZONS	1- 1	1	+ 1/4	+33.3
C	COMPUTER NETWORK	1- 3	2 5/8	0	0.0
N	COMPUTER SCIENCES	2- 6	5 1/8	+ 1/8	+2.5
O	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
C	COMPUTER USAGE	2- 4	2 1/8	0	0.0
O	CONSHARE	3- 4	2 1/2	- 3/8	-13.0
O	DATATAB	1- 2	1 3/8	0	0.0
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	16 3/8	+ 7/8	+5.6
O	INFONATIONAL INC	1- 1	1/8	0	0.0
C	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
C	KRANT ASSOCIATES	2- 3	2	0	0.0
O	KEYDATA CORP	2- 3	2 3/8	0	0.0
C	LOGICON	3- 5	3 3/4	0	0.0
A	MANAGEMENT DATA	1- 3	1 7/8	0	0.0
N	NATIONAL CSS INC	6- 14	11 7/8	+1 1/4	+11.7
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	11 1/8	+ 1/8	+1.1
N	PLANNING RESEARCH	2- 6	3 3/4	0	0.0
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RARIDATA INC	2- 5	3 1/8	- 1/4	-7.4
C	REYNOLDS & REYNOLD	10- 24	13 1/2	+2 1/2	+22.7
C	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/4	+ 1/8	+11.1
O	TYMSHARE INC	7- 21	18	+1 1/4	+7.4
A	URS SYSTEMS	2- 4	3 1/4	- 1/8	-3.7
N	WYLY CORP	2- 4	3	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULTI	4- 9	7 3/8	- 1/4	-3.2
O	ADVANCED MEMORY SYS	1- 7	4 7/8	+ 1/2	+11.4
N	AMPEX CORP	3- 7	5 5/8	+ 3/4	+15.3
C	ANDERSON JACOBSON	1- 3	1 7/8	+ 1/8	+7.1
O	BEEHIVE MEDICAL ELEC	1- 5	3 3/8	+ 1/4	+8.0
A	BOLT,BERANEK & NEW	5- 13	9 7/8	+ 1/4	+2.5
N	BUNKER-RAMO	4- 8	4 3/4	0	0.0
A	CALCOMP	4- 7	4	+ 1/4	+6.6
O	CAMBRIDGE MEMORIES	2- 5	2 3/8	- 3/8	-13.6
N	CENTRONICS DATA COMP	7- 25	18	+3 3/8	+23.0
C	CODEX CORP	15- 38	36 1/2	+5 3/4	+18.6
C	COGNITRONICS	1- 2	1	+ 1/4	+33.3
C	COMPUTER COMMUN.	1- 2	3/4	- 1/4	-25.0
C	COMPUTER CONSOLES	3- 7	4 1/4	+ 1/2	+13.3
A	COMPUTER EQUIPMENT	1- 2	1 7/8	+ 1/8	+7.1
O	COMPUTER MACHINERY	1- 2	1 1/4	0	0.0
C	COMPUTER TRANSCEIVER	1- 2	1 1/8	0	0.0
C	CONTEL	2- 5	2 7/8	- 1/8	-4.1
N	CONRAC CORP	12- 23	19 1/4	+3 1/2	+22.2

EXCH		1975 PRICE RANGE (1)	CLOSE SEP 24 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	5- 16	9 1/4	+ 5/8	+7.2
A	DATA PRODUCTS CORP	2- 6	4	+ 3/4	+23.0
O	DATA TECHNOLOGY	1- 3	1 3/4	+ 1/8	+7.6
O	DATUM INC	1- 2	1 1/4	+ 1/8	+11.1
O	DECISION DATA COMPUT	4- 7	4 1/4	- 1/4	-5.5
O	DELTA DATA SYSTEMS	1- 1	1/8	0	0.0
C	DIVAN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	1 3/4	+ 1/8	+7.6
O	FABRI-TEK	1- 1	7/8	0	0.0
C	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	3- 6	4	- 1/8	-3.0
N	HARRIS CORP	18- 28	22	+1 1/4	+6.0
A	INCOTERM CORP	3- 12	9 7/8	+ 3/4	+8.2
C	INFOREX INC	2- 5	2 5/8	+ 1/8	+5.0
O	INFORMATION INTL INC	8- 14	10 3/8	- 1/2	-4.5
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	MILGO ELECTRONICS	8- 24	17 1/8	+1 1/2	+9.5
N	MOHAWK DATA SCI	1- 5	3 5/8	+ 5/8	+20.8
C	OPTICAL SCANNING	1- 3	3	0	0.0
O	PENPIL CORP	2- 2	1 1/8	0	0.0
O	RERTEC CORP	2- 8	4 1/4	- 1/4	-5.5
A	ROTTTR INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	5/8	- 1/8	-16.6
O	QUANTOR CORP	2- 6	5	0	0.0
O	RECOGNITION EQUIP	2- 9	6 1/4	+1	+19.0
N	SANDERS ASSOCIATES	3- 11	7 5/8	+1 3/8	+22.0
O	SCAN DATA	1- 3	1 3/4	0	0.0
O	STORAGE TECHNOLOGY	6- 17	12 5/8	+1 1/8	+9.7
O	SYCOR INC	5- 15	13 1/2	+1	+8.0
O	T BAR INC	3- 6	6	+ 3/8	+6.6
O	TALLY CORP.	1- 5	3 1/4	0	0.0
O	TEC INC	1- 4	3	0	0.0
N	TEKTRONIX INC	18- 41	37	+4	+12.1
N	TELEX	1- 3	2 1/8	+ 1/8	+6.2
O	WANGCO INC	4- 9	5 1/4	- 3/8	-6.6
O	WILTEK INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
C	BALTIMORE BUS FORMS	4- 5	4 3/4	0	0.0
A	BARRY WRIGHT	5- 7	6 1/8	+ 3/8	+6.5
O	CYBERNATICS INC	0- 1	3/8	- 1/8	-25.0
A	DATA DOCUMENTS	29- 42	32 1/2	0	0.0
O	DURLEX PRODUCTS INC	12- 25	15 1/2	- 1/2	-3.1
A	ENNIS BUS. FORMS	5- 7	5	0	0.0
O	GRAHAM MAGNETICS	5- 10	8 1/2	+ 1/4	+3.0
C	GRAPHIC CONTROLS	8- 21	13 1/2	+1 3/4	+14.8
N	3M COMPANY	43- 68	54	+4 3/8	+8.8
O	MOORE CORP LTD	39- 51	45	+1 3/4	+4.0
N	NASHUA CORP	11- 22	12	+ 7/8	+7.8
O	STANDARD REGISTER	11- 20	16 1/4	+ 3/4	+4.8
O	TAB PRODUCTS CO	4- 8	6	0	0.0
N	WARCO	17- 24	19	- 1/4	-1.2
O	VANIER GRAPHICS CORP	4- 7	4 1/2	0	0.0
A	WABASH MAGNETICS	3- 5	3 3/4	- 1/4	-6.2
N	WALLACE BUS FORMS	15- 25	16 1/2	+ 3/8	+2.3

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NEWSPAPER

GAO Probing $403 Million SSI Errors

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Problems with a computerized payment system designed to issue checks to recipients who qualify for the Supplemental Security Income (SSI) program have been blamed for more than $403 million in overpayments over the past 18 months.

This Social Security Administration (SSA) program, which by June 30 had issued $8,075,277,809 in both state and federal funds, is now being scrutinized by the General Accounting Office (GAO) at the request of Sen. Birch M. Bayh (D-Ind.). Findings are expected next month.

Bayh said he believes the overpayment errors "probably will get as high as $1 billion in taxpayers' money" when all studies are completed.

The problems, which apparently defy short-range solutions, seem to have developed from at least five major difficulties, interviews with SSA spokesmen revealed.

First, about 1,300 different sets of files previously maintained by municipal, county and state governments had to be converted for centralized processing by SSA, in compliance with the law. Some may not be perfect yet.

Second, changes in legislation during the pre-implementation period made it necessary to make changes in parts of the system already designed.

Third, a Supreme Court ruling forbade reducing the amount of an individual overpayment without a hearing, regardless of whether the overpayment was a result of a DP error or a change in eligibility, an SSA spokesman said.

(Continued on Page 5)

IBM Indicted for Conspiracy to Thwart Bidding

By Nancy French
Of the CW Staff

JERSEY CITY, N.J. – IBM conspired with city officials here to thwart free, open and competitive bidding in order to win the contract for a new computer system, a Hudson County grand jury charged in an indictment handed down here recently.

As evidence, the indictment alleged specifications in the city's request for proposal (RFP) issued on April 3, 1974 described "almost exactly" the characteristics of an IBM 370 system and related software packages.

Further, information for that RFP was provided by IBM employees interested in closing the contract, the indictment charged.

In addition to IBM, the indictment named three current city employees, two former city employees and a bank executive.

The alleged conspiracy began about Sept. 18, 1973 and the RFP for the city's new computer system was issued eight months later.

In a statement, IBM said it was "shocked" at the indictment, particularly since company officials requested an opportunity to testify to assure the grand jury had all the facts needed "to reach a sound decision." IBM said it was "never given" that chance.

A "thorough investigation" has showed some IBM personnel "may have gone too far in an intensive and overzealous sales effort," but there are "absolutely no facts that could lead any reasonable person to conclude that an indictment of criminal conspiracy against IBM was warranted," IBM said.

"There were no bribes, no passing of money, no other unlawful conduct," the company added.

How Grand Jury Saw It

But the grand jury saw it otherwise, and the scenario described in the indictment went as follows:

After IBM was given an exclusive opportunity to make a sales pitch to city officials on Oct. 11, 1973, Peter Korn, former Jersey City business administrator, asked Eugene Josephs, an IBM sales representative, to do a study exploring the feasibility of converting existing computer programs from NCR language to a language compatible with IBM equipment. That study was completed on or about Nov. 19, 1973.

The next day, Korn signed a letter asking IBM to keep an IBM 370/115 on order for the city. The system was actually ordered even before the study was begun, the indictment said.

Sometime thereafter, IBM prepared two drafts of "detailed specifications" for a new computer from which portions were lifted and incorporated verbatim in the RFP placed out of bid on April 3, 1974, the indictment alleged.

(Continued on Page 3)

Univac 1100/10 Set for Mid-Sized Mart

By Patrick Ward
Of the CW Staff

ST. PAUL, Minn. – Univac has entered a lower priced 1100 series mainframe into the mid-size CPU market which, it claimed, offers a wide price/performance margin over IBM, Burroughs and Honeywell equipment.

The minimal 128K-word Univac 1100/10 processor can perform roughly two and one-half times as many operation/sec per $1,000 of purchase price as a similarly sized IBM 370/135, Univac said.

The 128K 1100/10 also comes out ahead of the IBM 370/145, Honeywell 66/10 and 66/20 and Burroughs B6738 and B6748 with similar memory size, Univac claimed.

Larger 1100/10 processors also show price/performance advantages over their competition, Univac said.

The 1100/10 supports the full range of 1100 series software and hardware, thus bringing "large-scale multiprocessing and multiprogramming to the medium-scale price segment of the market," the company said.

This latest 1100 series model is intended to offer users a growth path to larger 1100 machines without forcing the user to replace much previously installed equipment, it added. The 1100/10 systems can be field-upgraded to faster 1100/20 systems.

The 1100/10 is both faster and less expensive than the Univac 1106, previously the lowest priced 1100 series CPU. The 1100/10 compares in size to Univac's byte-oriented, noncompatible 90/60 and 90/70 line, a spokesman said.

The 1100/10 can address up to 512K of semiconductor main memory. Three 128K modules can be added to the original 128K module, or the memory can start with a 256K module and be increased with a second module of the same size. Cycle time is 1.125 μsec.

The 1100/10 is not a particularly fast machine as today's technology goes, but the 4K chip MOS memory helps keep the price down, the spokesman said.

The 1100/10 offers 128 general registers, from four to 16 I/O channels and I/O channel parity.

Four high-performance disk drives are available for the 1100/10 system – the Univac 8405, a fixed-head disk in two versions for high-speed, real-time applica-

(Continued on Page 3)

IBM Hikes Equipment Prices 4%, Says Maintenance Will Rise 9%

By E. Drake Lundell Jr.
Of the CW Staff

ARMONK, N.Y. – Prices are going up for most computer equipment from IBM.

Rental and purchase prices will increase approximately 4% and maintenance charges will rise about 9%, the firm said last week.

The price increases, which IBM said "reflect the partial recovery of the generally increasing cost of doing business," apply to most of the products offered by both the firm's Data Processing Division (DPD) and the General Systems Division (GSD).

All of DSD's products will rise in price, the firm said, except for several recently announced or recently shipped products.

The products unaffected by the 4% increase in purchase and rental prices include the 3344 disk drive, the 3350 disk drive, the 3600 financial communications system, the 3650 retail system, the 3660 supermarket system, the 3760 dual key-entry station, the 3767 communications terminal, the 3770 data communications system, the 3790 communications system and the 3800 printing subsystem.

The prices of all other DSD products will rise, with the purchase price increase in effect immediately and the rental increase effective Jan. 1.

At GSD, the purchase and rental rates for the System/3 Model 12 will not be raised.

(Continued on Page 5)

Aetna Joins Satellite Venture

WASHINGTON, D.C. – A large data communications user will join IBM and Comsat General to establish a domestic satellite system.

Aetna Life and Casualty will become the third partner in the CML Satellite Corp. under a plan announced by the three firms last week. The plan meets the requirements for ownership of the company mandated by the Federal Communications Commission in February [CW, Feb. 5].

Under the arrangement, IBM and Comsat General will each initially own 42.5% of the stock in the new firm and Aetna will have a 15% interest. Aetna, however, will have the option of increasing its ownership to 33.3% in the period before the satellite system becomes operational.

All three would make an investment of up to $55 million each in the system for a total investment of $165 million.

The three partners did not outline operational plans for the proposed system last week, but promised to release more details in a filing with the commission within 60 days.

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In Antitrust Trial Testimony

HIS Concedes IBM Can Force Market Exit

By Edith Holmes
Of the CW Staff

NEW YORK – The question went something like this: Can IBM take any actions which might lead to Honeywell's exit from the mainframe business?

But to Clarence W. Spangle, president of Honeywell Information Systems (HIS) and executive vice-president of Honeywell, Inc., during his testimony as a government witness last week in the trial of the Justice Department's antitrust suit against IBM [CW, Oct. 1], this query hit at the central point the government is trying to prove.

Specifically, it may have forced several major contenders to abandon the business, the Department of Justice contends.

Do the other mainframers feel and react to such a threat? And, if competition is so limited, won't users ultimately be the ones hurt? These are among the questions that must be answered – and answered in the affirmative if the government is to win its case.

Spangle naturally hesitated in giving an answer. "Well, theoretically, there are actions which it could take that would have that result.

"I have no information or idea it is motivated to do that," he said, adding, "I don't want to indicate to the public at large it's so easy to put Honeywell out of the computer business."

No Choice

The Honeywell executive felt he had no choice but to answer the question in that manner; he has a company with customers and stockholders to protect.

But his answer pointed out a problem the Justice Department is likely to run up against again and again in its bid to have the mainframe makers, in particular, say publicly what they have often expressed privately.

From the viewpoint of Grant Moy, the government attorney questioning Spangle on direct examination, there was no choice but to pursue his initial question with: Whether IBM is motivated to take actions that would force Honeywell out of the business, would the corporation be able to do that – what are those theoretical possibilities?"

Placed in such an uncomfortable situation, Spangle did not answer immediately, prompting the court to deliver a brief lecture on the obligation of a witness in accordance with his oath "to tell the truth if you have an answer you can give.

"The impact of that answer on Honeywell or anyone else is of no consequence," Judge David N. Edelstein added.

At that moment, counsel for Spangle as a representative of Honeywell stood up and asked to be heard by the court. The judge denied an open court statement by the attorney, but agreed to hear him in private.

'Robing Room Conferences'

Unlike most of the "robing room conferences" held in this trial so far, this one was not and will not be transcribed. Asked why not, Edelstein responded that, as a third party not directly involved in the suit, Honeywell had no right to expect its counsel to have a say in court.

"I listened to Honeywell's counsel out of courtesy," he said.

Well-Rehearsed Reply

Having come at the end of the day, the question posed by Moy had to wait until the next day to be answered. Asked again what the theoretical possibilities were that IBM could force Honeywell from the general-purpose computer systems business, Spangle gave a well-rehearsed reply.

"Given the fact that, at the end of 1974, IBM had more than $3.5 billion dollars in cash and cash equivalents; given the fact that its rates of profit before interest and tax have been about 25% or in some cases in excess of that, whereas those of Honeywell have been, on the average, over the past few years at around the 10% level and those of HIS at a still lower level; given the fact that IBM has a much larger number of installations than has Honeywell – it is theoretically possible that IBM could effect a drastic price reduction in general-purpose computer systems," Spangle said.

In addition, the corporation could, during periods of high inflation, fail to raise prices in line with increases in cost, he noted.

"If that were to happen and were to be continued over any extensive period, HIS would have to probably react and reduce its prices to the point where it could become unprofitable," Spangle added.

"I have no information or belief that IBM intends to do this sort of thing or that it would do it," Spangle quickly cautioned. "Frankly, I don't think it would be in the best interests of its shareholders to undertake such a program."

Analysis

IBM Document Ruled Not Enough To Reopen Telex Case Discovery

TULSA, Okla. – Even with the addition of new evidence [CW, Oct. 1], there is no need at this time to reopen discovery in the Telex vs. IBM antitrust case, according to a Federal District Court judge here.

Judge A. Sherman Christensen, who handed down the original decision in favor of Telex in the case, said last week "no showing yet has been made to warrant this court's reopening its discovery on the theory that the documents in question were wrongfully withheld in this proceeding."

However, his ruling would not preclude the use of such documents at the appropriate time, he said, indicating that time would come after the Supreme Court has ruled on Telex's request for a review of the case.

In reaction, IBM said "we think the importance of the document is put into perspective by the decision . . . to deny all motions made by Telex based on it."

The document in question showed IBM management felt constructing interfaces for its peripherals to work with other systems would be time-consuming and expensive.

IBM lawyers in the Telex case argued such interfaces were relatively minor undertakings.

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Grand Jury Indicts IBM for Conspiracy to Foil Bidding

(Continued from Page 1)

The city then decided a larger model would be more suitable and changed the order to a 370/125, according to the indictment.

Other Vendors Rebuffed

During the time city officials were "meeting with IBM" on the procurement effort, representatives from both Honeywell Information Systems and Burroughs Corp. who contacted them about possible equipment changes were told the city "was not planning any immediate changes," according to the indictment.

About March 11, 1974, before the RFP was issued, Walter Happell, then DP director for the city, began working with IBM to convert the city's computer programs, written in NCR Neat/3, to an IBM-compatible language.

Later that month, Thomas O'Connell, manager for IBM's New Jersey branch, internally confirmed by written memorandum Jersey City's order for a 370/125.

Between mid-March and mid-April, city officials employed DP consultant Robert Rapp as a broker to arrange for computer time so cards could be keypunched as part of the conversion project.

An NCR disk pack conntaining computer programs in NCR Cobol was delivered in April to Better Brands, also known as Data Associates, in Long Island City, N.Y., where cards were punched from the disk pack as a preliminary step in converting the Jersey City Board of Education NCR Cqbol programs to IBM Cobol.

On April 3, 1974, the city issued bid specifications for the new system which incorporated, almost verbatim, the language from prior sets of specifications given to the city by IBM.

A second part of the specifications, physically prepared by IBM personnel, was written in language which, the indictment said, described "almost exactly the characteristics and capabilities of an IBM Series 370 computer and related software packages despite the fact that the detail employed was not even directly related to the activity for which the purchase, contract or agreement was to be made."

The following month, an "evaluation committee" consisting of some of the same city officials who participated in writing the contract issued a report recommending the contract be awarded to IBM, according to the indictment.

Peter Korn, Walter Happell and Joseph Cahill, the city's former finance director, were charged separately for conspiracy and for violating their duties as public officials.

IBM's Eugene Josephs and Roger Forsyth, an executive of First Jersey National Bank, were charged with conspiracy.

Thomas O'Connell of IBM was listed as an unindicted coconspirator.

IBM Saw It This Way

After looking into the matter, IBM explained that, in June of 1973, IBM sales representatives began "a vigorous sales effort" to convince city officials of the benefits of centralizing and to sell the city an IBM computer system to do the work.

As a result, a 370/125 was installed which is handling the work efficiently. There are "no problems of misrepresentation, poor performance or excessive costs," IBM said.

IBM salesmen were confident they would make the sale long before the city's award, IBM said, and the early equipment order was made for that reason.

As for IBM's involvement in drafting the city's RFP, the company explained city officials had "a lack of expertise" about what was needed for an efficient, centralized DP system.

As a result, city officials leaned heavily on IBM for advice and recommendations, IBM said.

Univac Adds 1100/10 To Mid-Sized Market

(Continued from Page 1)

tions; the 8430 and 8433 removable disk systems for controlling large data bases; and the 8425 removable disk drive.

Univac also announced the Uniservo 14 magnetic tape subsystem for the 1100 family of computers.

A low-cost subsystem, the Uniservo 14 offers 9-track phase-encoded and 7- and 9-track NRZI recording at 96K byte/sec.

The tape subsystem provides automatic loading and threading capability using standard or cartridge tape reels.

The 1100/10 system provides for reliability by employing built-in error correction techniques, by maximizing the modularity of system components and by means of autorecovery capabilities, Univac said.

In addition, interchangeable data paths to the central processor are provided through dynamic reconfiguration, the company noted.

Maintenance Options

Maintenance for the 1100/10 is facilitated in several ways. One is for the user to utilize a set of routines for on-line maintenance to check out suspected components and diagnose their condition without disrupting operations.

Another technique is to use Univac's Total Remote Assistance Center (Trace) system.

With Trace, the user can connect his 1100/10 directly to the Univac Trace center in Roseville, Minn. for diagnosis and repair.

Monthly rental (including maintenance) for the Univac 1100/10 on a one-year contract begins at about $20,000 and ranges upward to about $55,000.

The comparable purchase price ranges from approximately $800,000 to $2 million. Deliveries will begin in April.

AUSTRALIA

Authentic information is freely available **WITHOUT CHARGE** from the Australian Embassy in Washington, D.C. (202) 797-3000, and the Australian Consulate General in New York (212) 245-4000, San Francisco (415) 362-6160, Los Angeles (213) 380-4610 and Chicago (312) 329-1740.

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GAO Probing SSI as Overpayments Top $403 Million

(Continued from Page 1)

A backlog of hearings keeps many overpayments that frustrated SSA officials know how to correct going out month after month, with no assurance recipients will return more than about 38% of the funds.

Fourth, late reporting of changes in eligibility keeps individuals' files in an eternal state of flux and causes retroactive changes.

Finally, occasional logic errors from time to time have generated rather dramatic one-time-only overpayments [CW, Sept. 3].

The Senate Appropriations Committee's Subcommittee on Labor and Health, Education and Welfare Department Appropriations is considering legislation to amend certain Social Security benefits programs.

But before it acts, it wants solutions to some of the systems problems that have bogged down SSA DP operations since the SSI program began a year ago January, a staff member said.

Effect on Other Programs

Bayh also has expressed concern about the effect SSI's seemingly error-prone recordkeeping has had on other federal grant programs.

Medicare, Medicaid and food stamp programs depend in some part on SSI records, a Bayh staff member said.

State magnetic data exchange tapes are furnished by SSI's DP department to 26 states and the District of Columbia for use in maintenance of each state's SSI program as well as the administration of Medicaid programs.

Exchange of erroneous eligibility information can spread errors throughout the entire nation's welfare programs on both the state and federal levels, according to Bayh.

Sought in the GAO probe are answers to questions such as:

- Just what is the current overpayment figure.

Estimates based on a routine quarterly review of case records as of June 30 ranged from a low of $403 million to a high of $424.6 million for the 18-month period.

- How much of the overpayment total can SSA expect to recover?

The SSA told Bayh experience has shown 14% of recipients will return overpayments in lump sums and 24% will pay in installments, for a total of 38%.

About $28.4 million has already been collected and corrected, SSA said, but $39.4 million has been written off as uncollectable.

The GAO is expected to look into the estimated $35 million in underpayments.

The GAO will also attempt to determine how errors in SSI records affect other programs administered by the SSA. Although SSA officials deny there is any effect, Bayh said constituents tell him otherwise.

One woman who received overpayments of $146 a month started putting this in the bank at the suggestion of her local SSA case worker. After 10 months her bank account had built up to $1,400.

"The next thing she knew she received a notice saying she was being cut off from Medicaid because she had too much money in the bank," Bayh said.

The GAO is also looking for ways to save money by streamlining systems. Although the SSA has been working on a system linking SSI to SSA records to provide for fully automated eligibility verification before SSI benefits are paid, this system has not gotten off the ground because the computers in use are "incompatible," SSA officials said.

IBM Raising Prices Of Products, Upkeep

(Continued from Page 1)

The purchase prices of the System/3 models 6 and 10, the System/7, the 1130, the 1800, the 360/20 and the 5100 portable computer will also be unaffected by the raised rates.

Furthermore, GSD said it has not raised the rates on several products which received reduced rates in July, including the 370/115 and 125 CPUs, optical character reading equipment and some tape and disk products as well as certain terminals and printers.

Maintenance Rates Hiked

In the area of maintenance, all hourly field engineer and customer engineer rates are going up by the approximately 9% figure.

For example, for Class 3 hourly service during working hours, the new rate will be $44.25 compared with the $40.75 previously in effect.

Outside normal hours, the fee for the same class of service will be $57.75, up from $53.

On monthly maintenance contracts, the price will rise on approximately 300 types of equipment; it will stay the same for 173 types of equipment but go down on 27 equipment categories.

The no-change policy is in effect for such devices as the 3650 retail system, the 3660 supermarket system, the 165 CPU, the System/3 CPU and the System/32.

Some Reductions

Price reductions for monthly maintenance will be made on such equipment as the 370/195 CPU, the 3360 memory for the 155 and 165 CPUs, the 2365 memory for the 360/65 and the 3046 power unit for the 145.

Increases will affect all other 370 CPUs, all 360 CPUs, the System/7, 1130 and 1800 CPUs as well as all other equipment not exempted from the raised rates.

The hourly maintenance rate increases go into effect immediately while the new monthly rates begin Jan. 1.

IBM estimated the average effect on a customer installation will be a 3% rise in the cost of doing business next year.

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Sicob Brings Technology — And Politics — to Paris

By E. Drake Lundell Jr.
Of the CW Staff

PARIS – Political controversy more than technical innovation marked the 26th edition of the Salon International de l'Informatique du Bureau (Sicob) here this year.

Both the sessions of Convention Informatique, held in conjunction with Sicob, and the huge exhibit itself were disrupted at one time or another by demonstrators protesting the French government's plans in the computer industry.

But even with the disturbances, Sicob managed to live up to its reputation as one of the largest displays – if not the largest – of computers and related office equipment in the world.

This year's version, which ran from Sept. 18 to Sept. 26, was fully expected to break last year's pace. At that conference, 1,673 exhibiting companies represented 25 countries and drew 267,237 visitors from 99 countries. The final statistics for this year's attendance will not be available for some time.

But while all of the big mainframe makers were there, along with most of the mini makers and peripheral vendors that operate in France, the real interest at the show centered on two issues that are splitting the French computer community.

The first dealt with a government plan here to establish a national numbering system for individuals under the code name "Project Safari;" the second dealt with the future of the industry itself and government funding in the industry.

Under Project Safari, all Frenchmen would be assigned a number, and a data bank with this information would be established – a move that has been opposed by several groups since it was originally proposed in March of last year.

But while Project Safari caused consternation among civil libertarians and their sympathizers here, the real issue that brought demonstrators to the streets and into the keynote session involved the future of the French computer industry itself.

Plan Calcul

For years, under Plan Calcul, the French government has poured millions of dollars into Compagnie International pour l'Informatique (CII), the French national entry into the computer business.

But now that the government has taken over an interest in Honeywell Bull, which is still 45% owned by Honeywell, there is a great deal of confusion here over the future of CII.

The French government will own 53% of Compagnie des Machines Bull when that firm is formed by the merger of Honeywell Bull and CII at the end of October [CW, May 21]. However, the government has not announced any working details of the proposed merger.

At the same time, the government has outlined plans to lay off 1,000 workers out of 5,000 at one of the CII facilities, which has led many within that company to assume the future will be based more on Honeywell Bull than on CII, leading to large-scale displacements of CII workers.

Besides that purely economic issue, there is also the problem of national pride in the picture, with many Frenchmen viewing Honeywell Bull as "too American" to truly be the French entry into the world marketplace, since Honeywell still controls such a large portion of the stock.

The problem, therefore, seems to be a two-phased one: first, there is a lack of solid information about what will happen, if anything, to the government support plans and, secondly, the entire subject brings the issue of national pride to the forefront of the debate.

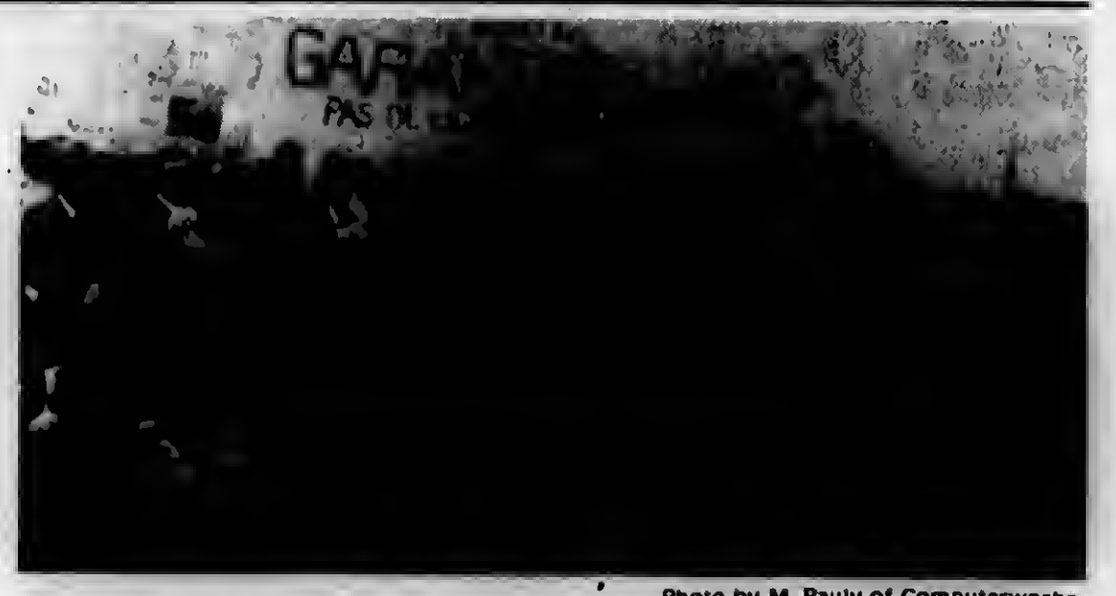


Photo by M. Pauly of Computerwoche

Demonstrators concerned about the future of the French computer industry – especially as it reletes to CII – massed outside the Sicob exhibit hall . . .

And at Sicob those worries and fears on the part of French workers were translated into action at both the exibits and the sessions.

Keynoter Quizzed

The keynote speech at Convention Informatique, delivered by Hugues de L'Estoile, the French ministerial representative for industry, was enlivened considerably by questioning from the floor on the CII issue, even though he managed to avoid answering the questions in a meaningful manner.

And, later that week, over 100 demonstrators showed up to protest the unknown future at the opening of Sicob itself, providing an interesting contrast to the rather staid exhibit inside, where most firms displayed only old products.

The CII protesters, many of whom said Plan Calcul has now been turned into "Plan Honeywell," sought assurances from the government about the future of their jobs – particularly in light of the layoffs and a planned salary increase this month.



CW Photo by E.D. Lundell Jr.

. . . While business as usual continued inside.

In addition, the more radical of them urged the government to completely nationalize both CII and Honeywell Bull into one 100% government-owned business in order to make a strong entry into the market without a large American investment.

But while the protest added some life to the opening of the show, it was soon over and the issue was still unresolved.

As French as Crepes

PARIS – Although billed as an "international" exhibition, the Sicob show here late last month was as French as crepes and cancan girls.

While visitors came from all over the world to view the exhibit, they were often stymied because booth personnel generally spoke only French – only a smattering of English or German was heard among the exhibitors.

And the international marketing men that flock to most shows on the continent, such as the Hanover Fair and Systems 75, were notable more by their absence than their presence at Sicob.

Even the facilities for the press were limited almost exclusively to the French-speaking press, with little help available for the journalists that came to the show from around the world.

So while it called itself an "international" exhibit, Sicob was really a French show for the French – and a quarter million of them turned out during the two-week run.



CW Photo by E.D. Lundell Jr.

At Sicob vendors used even the tops of their booths to advertise.

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Cost, Decentralization Benefits Outweigh Disadvantages of Mini

By E. Drake Lundell Jr.
Of the CW Staff

PARIS – The advantages of minicomputers far outweigh the disadvantages; and the disadvantages are becoming fewer every day, according to J. Donio, DP deputy manager at the National Employment Board here.

The most obvious advantage of the minicomputer system is the cost of the hardware, but the software for a minisystem or network of minicomputers can be as expensive as it would be for one large system, Donio noted at a recent session of Convention Informatique held here in conjunction with the Salon International de l'Informatique de Bureau (Sicob).

However, cost is not the only factor that makes minicomputers attractive to the system designer, he said.

First, the minicomputer allows the designer to decentralize the operations of a firm, which puts the processing closer to the point of a transaction and subsequent data collection.

It is always more expensive to transmit data in its crude state, since it is then likely subsequent transmissions will be required to correct errors.

But, besides the cost factor, there is also a psychological benefit derived from putting the processing close to the origin of the data. This is because the people who know the data best get involved in the processing and not just the collecting of that data.

Often, these will be the same people who will have to use the data also, and they know what reports and other outputs they need from the system, he indicated.

If the system is under their control locally, it is much easier for them to make it adapt to their real needs.

Overcomes Obsolescence Problem

Furthermore, minicomputers can also help overcome the problem of obsolescence in systems, he indicated.

In a multiunit system of minicomputers, individual CPUs in the configuration could be replaced on a rotating basis with the latest technology introduced at each replacement time.

In this way, the network can be constantly upgraded at a relatively low cost each time, instead of having to make a major system change all at once, as would have to be done with a system based around a large central CPU.

Another advantage of the minicomputer is the ease of installation for such systems and low investment required for noncomputer auxilliary equipment that is needed in computer rooms for large systems.

The systems don't need expensive air conditioning or other special equipment and are easier to maintain than the larger systems, Donio indicated.

The major drawback to the use of the minicomputer is the relative lack of power in the individual components, but this can be overcome by networking the systems, he indicated.

Another problem with the use of minicomputers today is that the range of software available for the units is limited, he indicated.

But, as more standards are developed in the area, this problem should be overcome as software developers realized the opportunities.

In addition, the system manufacturers will probably develop more software for their systems in the future, either as complete software packages or as software tools that make it easier for the end user to program the system himself.

CW At Sicob

System Safeguards Swiss Documents

PARIS – Switzerland is well known for its belief in secrecy, and that belief has lead the Department of Defense there to install a minicomputer system.

The system has allowed the department to dedicate an entire system to one application and still keep the costs down, according to M. Sulzer of the department, who spoke at a session of Convention Informatique held here recently in conjunction with the Salon International de l'Informatique de Bureau (Sicob).

The CPU and CRT are in a secret location, he said.

The Department of Defense wanted to develop a data base of all contracts it has outstanding and information on the firms with which it conducts business, he said.

This information was, of course, extremely confidential and the government had a responsibility to keep it secret.

Overall, the system needed to handle the equivalent of 50,000 documents, Sulzer said.

The organization installed a Digital Equipment Corp. PDP-11/40 with 64K of main memory, 40M bytes of disk, five CRTs, and a 300 char./min line printer and a computer-output microfilm (COM) system to meet the need.

All of the documents are microfilmed and indexed, with the index placed on the computer system. The index is a complete key-word index and has abstracts of all the documents, Sulzer said.

The user can access the system by key word, read the abstract and then, if he wants to see the entire document, he can look it up on a microfilm reader that is attached to the CRT workstation.

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Mini-Based Switching Eases Behind-the-Scenes Hassles

By Nancy French
Of the CW Staff

PHILADELPHIA – Anyone who has ever struggled with a home movie projector has probably wondered why things always look so smooth on TV.

The answer is that it's no accident; it takes a lot of often harried people to give television its polished look.

Recently though, more and more stations have turned to computers to produce the cleanest possible output and, especially, to assure all commercials air as ordered by their clients.

When mistakes are made airing a commercial, a station has to give that client a "make good" by running the commercial over again free of charge – which makes errors costly.

At most TV stations, the product transmitted to your home is carefully controlled by teams of technicians working with one eye on the clock and the other on a detailed schedule, which accounts for every second of the broadcast day.

Videotape operators and film projectionists are constantly loading, monitoring and unloading videotape cartridge machines, reel-to-reel videotape machines and film and slide projectors to air events that are often scheduled only a few seconds apart.

"With some commercial spots as short as 10 seconds and most only 30 or 40 seconds, a two-minute station break can get pretty hairy," one technician pointed out.

The individual who coordinates the activities of these technicians is the Master Control Technical Director (MCTD), who works at a large switching console with a button that controls every video source and audio source in the station.

He switches from event to event, sequencing the various commercials, public service announcements (PSA) and programs that are transmitted to viewers' homes on time.

Computerized Switching

At Station KYW here, one of five stations owned and operated by Group W (Westinghouse Broadcasting Co.), the MCTD has help from a new, minicomputer-based switching system.

KYW technicians now simply load commercials and program material on the appropriate videotape cartridge machines, reel-to-reel videotape machines or film or slide projectors. When the material is loaded, the technician keys in a unique six-digit house number using a keyboard on that machine; the number tells the system which machine has been assigned to each task listed on the schedule.

The system prerolls film and tape and then switches to the output of the machine assigned to each scheduled event in sequence by the real-time clock or based on the elapsed time of the previous event, with no human intervention, according to Charles Magee, Group W's engineering director.

The MCTD is still the focal point of the broadcast operation, but he is relieved of the chores of switching those events manually from his console.

Watches the 'Stack'

At KYW, the MCTD monitors the operation of the computer by watching the "stack," or list of scheduled switching events, that appears on a TV monitor mounted on his console.

"The mini keeps computing elapse times to assure no time problems will occur later in the stack," Magee explained. "If an item begins to flash, the MCTD knows he's got a problem in plenty of time to decide how to solve it."

In general, the MCTD need only take manual control of the switching operation if a problem arises, he added.

But the whole process actually starts long before even one slide is loaded on a projector – it begins with preparation of the schedule.

First the program schedule is planned, which accounts for about 48 minutes per hour. The remaining time, which is used for commercial breaks, is divided so several minutes fall on the hour, the half hour and in several intervals in between.

At this point the traffic department steps in to schedule the commercials sold by the sales department in the time periods requested by their clients. The traffic department also fills all unsold time during these breaks with PSAs or promotional announcements about upcoming station programs.



Traffic clerk Jackie Kirkland prepares the day's log by literally filling in the blanks.



CW Photos by N. French

Brenda Weiner, KYW-TV traffic manager, confers in Master Control with crew chief Eugene Comuzzi to discuss a last-minute commercial change. The "stack" is visible on the TV monitor between them.

Scheduling Speeded

At KYW, a 16K Digital Equipment Corp. PDP-11/15 minicomputer-based turnkey broadcasting system, developed by Central Dynamics Ltd. of Montreal, has vastly simplified and speeded up the entire scheduling process as well as its switching.

The mini supports two double-density disks, two printers, three CRTs and 14 separate numerical keyboards attached to 14 various film and tape machines.

Each piece of air material – be it commercial, PSA or station promotion – is assigned a six-digit house number. This number, which is linked to production information, organization name and time duration, for example, is stored on Iomec 3004 double-density disks.

Each day, when traffic clerks construct the schedule, they need only fill in the blanks of a skeleton version of the schedule prepared for the same day the week before, Magee explained.

Clerks key in the file number of the film or tape called for on a roughed-out schedule and the system calls up the remainder of the information needed to complete the item.

After all the new "spots" are input and verified, a Memorex 1250 printer generates the entire schedule in a matter of minutes on a continuous-feed multilith master which is sent to the station print shop for duplication.

On the day of broadcast, the few changes that must still be made are brought to Master Control by a traffic clerk and the MCTD edits the schedule via his CRT. He also assures corrections are made on the copies in the hands of key technicians, Magee explained.

Without a computerized system, getting the schedule typed, proofread and then duplicated and distributed required several days' lead time, during which additional spots were usually sold or the client changed his mind about the product he wanted to advertise, for example. Commercials and PSAs often had to be dropped or changed.

Much hand correcting went on, and usually one frazzled traffic clerk had to go all around the station changing every technician's copy of the schedule, Magee explained.

As the MCTD monitors the computer as well as KYW's output, he edits the schedule if it varies at all from the originally printed version. This becomes part of the station's official log of the broadcast day, in accordance with requirements set by the Federal Communications Commission.

Several copies of this official log are printed out by another Memorex 1250 in Master Control. One copy is kept on permanent file and another goes to the accounting department for use in billing receivables, Magee explained.

Neither accounting nor sales has been brought onto the system yet but "we're looking at ways to do that," he said.

Backup for the system is provided by a second PDP-11/15 in John Watson's office. Watson, who is Group W's director of technical automation, uses the second system for writing programs.

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Viewers who see these frames as part of an animated commercial promoting a local radio station might never guess they were keypunched on 80-column cards.

Simulated Animation Process Does Disney One Better

By Nancy French
Of the CW Staff

ELMSFORD, N.Y. – Ever wonder how letters and numbers can be made to dance around or literally rotate through space in the TV commercials and station identifications you've been seeing lately?

Computers At Work In Broadcasting

Some of this animation is done with Synthavision, a computer simulation process developed by Mathematical Applications Group Inc. (Magi) here.

The drawings that make up these three-dimensional animated sequences are programmed by computer rather than being drawn and colored by hand in the conventional way, Dr. Philip Mittleman, Magi president, explained.

Disney's Style

By comparison with Magi's Synthavision, conventional animation, pioneered most successfully by Walt Disney, is a very repetitive, painstaking art form. For every separate movement in a film, an artist must draw and color a separate drawing on a transparent sheet called a "cell."

In his studios in California, Disney employed hundreds of artists to produce the millions of cells needed to make a single feature film such as *Cinderella*.

These cells are placed in correct sequence and photographed frame by frame using an animation camera. After mixing with sound, the film is run on a projector at the standard motion picture speed of 24 frame/sec. This is fast enough to fool the eye into seeing actual movement.

Simple multiplication shows 60 seconds of animation could take as many as 1,440 cells.

"In his best days, Walt Disney couldn't do what we're doing now because it's just too complex to do by hand," Mittleman said. "If an animator tried to figure out what the shading and the perspective should be in some of these complex cartoons, he would go out of his mind."

The entire Synthavision process is done by computer, he said.

How it Works

"If you remember when the astronauts went to the moon, they carried a little television camera with them. When they would point it at a rock, for example, the camera merely measured the brightness at each point on a sensitive area, converted those measurements to a radio signal and sent them to earth where the pictures were put up on a CRT," Mittleman explained.

Our process is something like that, without using a camera," he said.

Bo Gehring, Synthavision creative vice-president and principal designer, starts the computerized process working from a series of sketches, or a storyboard, provided by the client. The storyboard describes the desired objects, their color, movement, camera angle and light source.

This information is keypunched on standard 80-column cards and fed into the company's 512K IBM 360/65 computer. The operating language is Fortran.

Then, using proprietary software developed by the firm, the system calculates the brightness and color at each dot and records the data line by line on magnetic tape, Mittleman said.

A 20K Data General Corp. Super Nova is then used to read the tape and generate each individual picture on a high-resolution, 1,000-line CRT, custom-designed by Information Displays, Inc. of Mt. Kisco, N.Y.

Using a standard animation camera, the pictures are photographed frame by frame right from the CRT, Gehring explained.

Color is added by photographing the CRT through a color wheel in a light-tight box. The camera shutter is held open for three CRT passes and a different primary color is mixed each time, he explained.

'Something Different'

The process is costly – ranging from $5,000- to $15,000 per minute, Mittleman said, but clients looking for "something different" find it's worth the price, according to Natalie Scofield of Carr·Liggett Advertising, Inc. in Cleveland.

"Since we were advertising an electronic medium, and our client was the top radio station in the city, we didn't want something that looked low-budget," she explained. "Mixed with computer-sounding music, the spots were very effective," she said.

While not nearly as time-consuming as standard animation, Synthavision spots can't be turned out in real-time either, according to Gehring, "because of the quality we're producing.

"It takes as much as eight hours to lay down the animation on film for a 60-second spot," Gehring said.

The same techniques used to film a 60-second commercial can be used in a feature-length cartoon or an educational film, Mittleman explained.

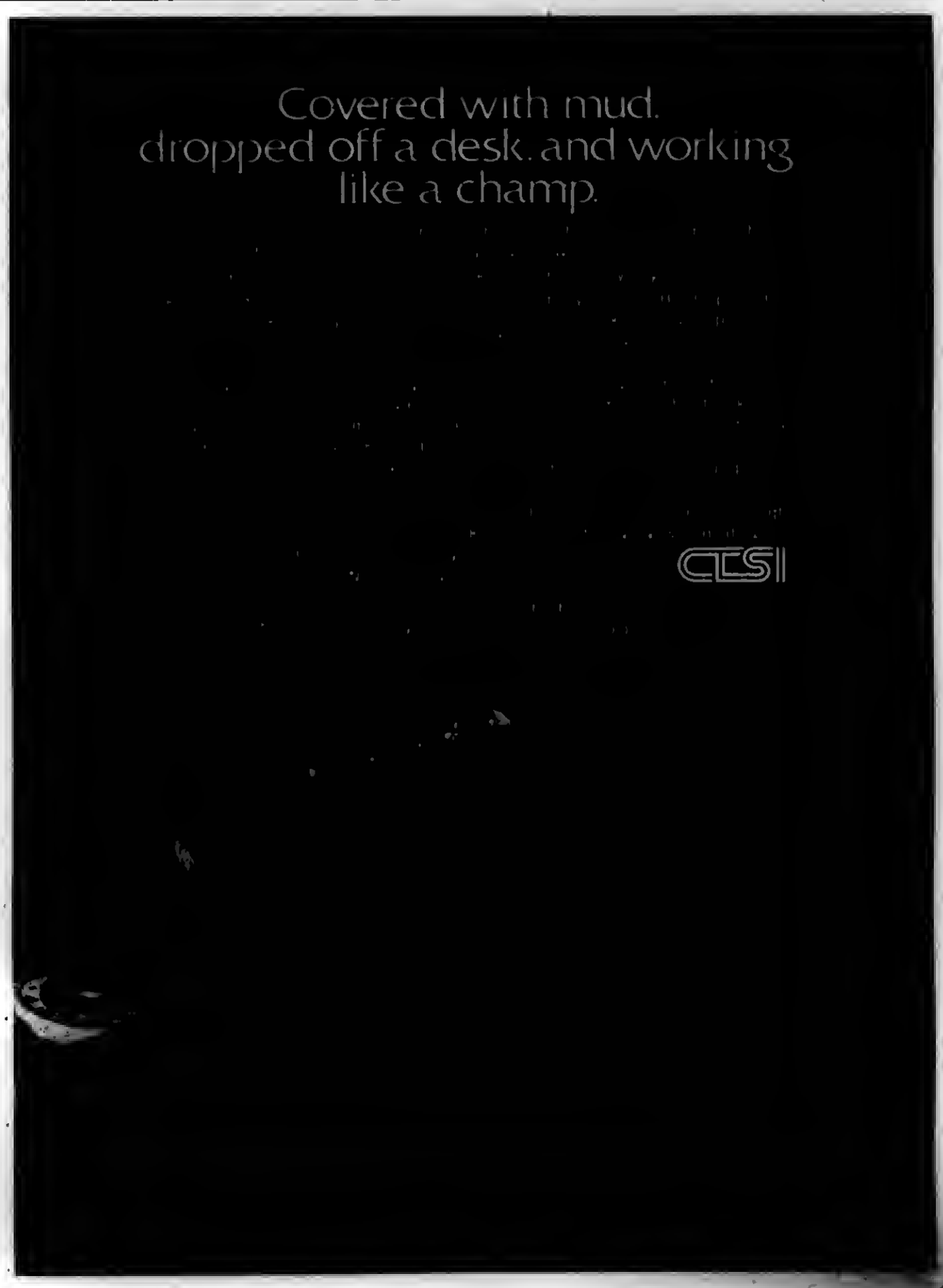
The only thing we can't really do yet is model people's faces," Mittleman said, "but we're working on it."

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DP as Disc Jockey

System Helps Produce Radio Programs

By Nancy French
Of the CW Staff

BOSTON – When WEEI-FM radio station listeners hear a favorite song, followed by an announcer giving its title and artist, that sound isn't coming from a disc jockey (DJ) spinning records in a studio.

Computers At Work In Broadcasting

The song as well as the announcement are just two "events" in the station's broadcast day that are prerecorded on cartridges sequenced and switched automatically by the station's on-line minicomputer.

And between these events, the system switches to brief segments of DJ chitchat, prerecorded on a voice track.

While listeners are enjoying a number by the Carpenters, for example, announcers and technicians are working together to record an upcoming news program, weather report or even the next day's voice track, Jon Arbenz, the station's general manager, explained.

"It's more efficient to prerecord these events," Arbenz explained. "It also produces a cleaner, nearly perfect air product."

How It Works

When Program Manager Peter Miller sits down to program a day's music selections, he can call for a list of all music recorded on cartridges by specific type such as ballads or female vocalists, for example.

Miller enters his selections by cartridge number, and the system completes the log, including such things as event number, file number, title and artist for each cut and duration, for example.

After the log is completed, technicians, working from a log printout, rack the cartridges in their proper slots in International Good Music, Inc.'s (IGM) Instacart playback machines according to the number on each cartridge label.

The slots are hard-wired to the mini so when the program log calls for a certain piece of music by event and slot number, the mini instantly cues it to begin to play when the preceding event is completed.

"Of course if the wrong cartridge is in that slot, the wrong piece of music will play," Robert Cook, engineering supervisor, said.

The program can be changed at any time up to a minute or two before the event is scheduled for air," Cook explained.

Although the computer is the heart of WEEI-FM's operation, it really doesn't do anything but sequence the "events" called for on the daily program log, Arbenz pointed out. "It takes the talent of a lot of individuals to make a radio station successful," he said.

The system, known as a human error reduction machine (Big Herm), consists of a DEC PDP-8E, two Diablo Systems, Inc. disk drives, a Centronix printer, two Data Computer Corp. CRT terminals and six Instacart playback machines. An Instacart has 48 slots, each with its own playing head, Cook explained.

In all, between the network line, microphones in the station's two studios, reel-to-reel tape recorders, record turntables, Instacarts and the like, the minicomputer can accept input from some 60 audio sources.

However, most of the material for the station's daily music program – "an adult, contemporary sound" – is recorded on cartridges resembling the 3M Co. cartridges used in automobile tape decks or for digital data collection.

Without the minicomputer, FM broadcasting would not really be what it is today, Arbenz said.

Historically, most broadcasters used their FM transmitters to simulcast whatever was airing on their AM stations. There were no FM station employees, and few commercial spots were sold.

Then, in August 1964, the Federal Communications Commission (FCC) ruled stations would only be permitted to simulcast AM programming during half their broadcast day. The balance of the broadcast material would have to be generated by the FM station itself, Arbenz explained.

CBS, WEEI's owner, met this requirement by recording half a week's worth of music tapes and sending duplicates to each of its seven FM stations. These tapes were rotated and played during different time slots over the course of the broadcast week.

Then, in the late '60s, CBS decided to expand FM. New transmitters were installed, additional staff was hired, and CBS management began to explore the possibilities of automation. WEEI was the test site.

As for maintenance, DEC maintains the computer itself. Cook has learned how to maintain all the peripheral gear himself, he said. If a problem turns out to be something he can't fix, the station gets good service from the vendors, he said.

WEEI-FM operates 24 hours a day, seven days a week with 17 employees. Across the hall, WEEI-AM employes 110 people to keep its 24-hour, all-news operation going.

"There's always a technican on duty on the AM side who can step in if a problem comes up during the 72 hours a week Big Herm is on alone," Cook said.



TV Station Uses T/S Service to Handle Commercials

By Nancy French
Of the CW Staff

MINNEAPOLIS – WTCN-TV, a large independent UHF station here, is one of about 40 television stations that uses a broadcast computer service to help write contracts for commercial spots, schedule commercial rotation on the air and bill their clients.

Computers At Work In Broadcasting

The service, provided by a division of Kaman Sciences Corp., includes time-sharing and data base management on two Control Data Corp. Cyber 72s, a Model 13 and a Model 14, in Colorado Springs as well as a turnkey system at the station.

The station's system utilizes a 28K Digital Equipment Corp. PDP-11/05 for local data entry, storage and communications functions.

Selling Time

Television time is sold in two primary ways – in a package and by long-term contracts.

If a client wants a spot next to 'All in the Family,' for example, he's got to be willing to take a couple of other spots adjacent to some lower rated shows as part of the deal.

As for commercials sold as part of a long-term contract, such as those that run for 13 or 26 weeks, these are rotated so some spots air during both peak viewing hours and periods when not as many people are watching, according to Pat Anderson, WTCN traffic manager.

Some are sold with the understanding they can be pre-empted if a higher priced, one-time-only spot is sold.

Store and Forward

To set up a commercial contract file in the Cyber's data base, for example, a traffic clerk working at a Hazeltine 2000 terminal at the station keys in all the information needed to confirm the contract.

This includes such data as client's name, the advertising agency code number, type of air schedule, duration of the commercial, contract duration and rate, for example.

The information is stored on the station's DEC RK-11 disk system until connect time, Anderson said, and "that's the only time this information has to be entered into the system unless the contract changes."

Then, once a day, the PDP-11/05 transmits the stored data to Colorado Springs, Anderson said.

The system plans a commercial rotation schedule according to parameters requested by the client and stores that information in the data base.

"Every morning our CDC 9342-1 printer has a printout of everything we keyed in the day before, as well as a printed confirmation contract for each new client and a nearly completed version of the next day's schedule.

"This schedule includes most of the commercials as well as the programs and public service announcements right from the data base," Anderson said.

The schedule is stored on the PDP-11/05 until last-minute commercial changes, public service announcements and promotions are added, she explained.

Once the schedule is completed it is printed, distributed and transmitted to a second minicomputer at the station – a PDP-11/15 – which is dedicated to the physical work of cueing projectors, rolling video-tapes and switching machines on and off in accordance with the air schedule, explained Ken Swanson, WTCN assistant production manager.

Developed by Central Dynamics Ltd. in Montreal, the system is linked by cable to the traffic mini, Swanson explained.

The PDP-11/15 keeps the entire day's schedule of events on-line and displayed on CRT terminals mounted on the Master Control Technical Director's (MCTD) console as well as others mounted elsewhere in the engineering department. It also controls switching much like the system in use at KYW in Philadelphia (see related story on page 8).

If technicians depart from the schedule and a station identification is omitted or a commercial "gets blown" – is not aired or is chopped off by mistake, for example – the MCTD inputs these errors or changes via his CRT, building a "log" of the broadcast day, Swanson said.

The next day, a printed version of the log goes back to the traffic department, where all changes are keyed in to assure clients are billed correctly and so exact air time – an invoice item – can be included.

Once a month the Cyber is used to process all accounts receivable. The only input needed from the accounting department is the commercial number, the name of the advertising agency, the client's name and the first air date.

Input from the station is sent by the PDP-11/05 to Colorado Springs, and the Cyber prints out the appropriate invoices on the station's printer.

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Bell System

Editorials

Hidden Documents

The recent revelation that IBM may not have opened its files completely to Telex Corp. during the discovery phase of the Telex vs. IBM [CW, Oct. 1] case is a serious charge that deserves immediate investigation.

The possibility of document withholding was raised when an IBM study was uncovered in the early phases of Memorex's antitrust suit against IBM, which revealed IBM itself had considered entering the plug-compatible peripherals business.

The IBM study showed the firm estimated the costs of developing interfaces for other vendors' systems to be high in terms of both manpower and resources.

However, all during the Telex case and particularly in the appeal of that case, IBM's lawyers argued such expenses were in reality "trivial."

It is clear Telex would have used this internal IBM memorandum to support its contention that such interface work was expensive — if the firm had had the document at the time.

The question to be resolved now is whether IBM intentially "hid" the document during the discovery phase of the Telex case or whether Telex merely overlooked it when sorting through the millions of documents that were made available to it during discovery.

In large business law cases, each side has a responsibility to the other to make available certain documents that bear on the case and only to withhold those that clearly have no relevance or that are privileged in some way.

The lawyers and businessmen on both sides have a responsibility to make sure that documents relating to the case are kept safe while the case is proceeding and that they are freely made available to the other side under the necessary court orders.

The evidence in this case is unclear at present, but it appears the documents were somehow overlooked by Telex in its search of the files. After all, if IBM wanted to keep the documents secret, it would also have kept them out of the Memorex case.

However, the possibility of deliberate withholding of the documents cannot be dismissed without an investigation.

This should be undertaken immediately by the federal district court which originally heard the case.

'Nuff Said

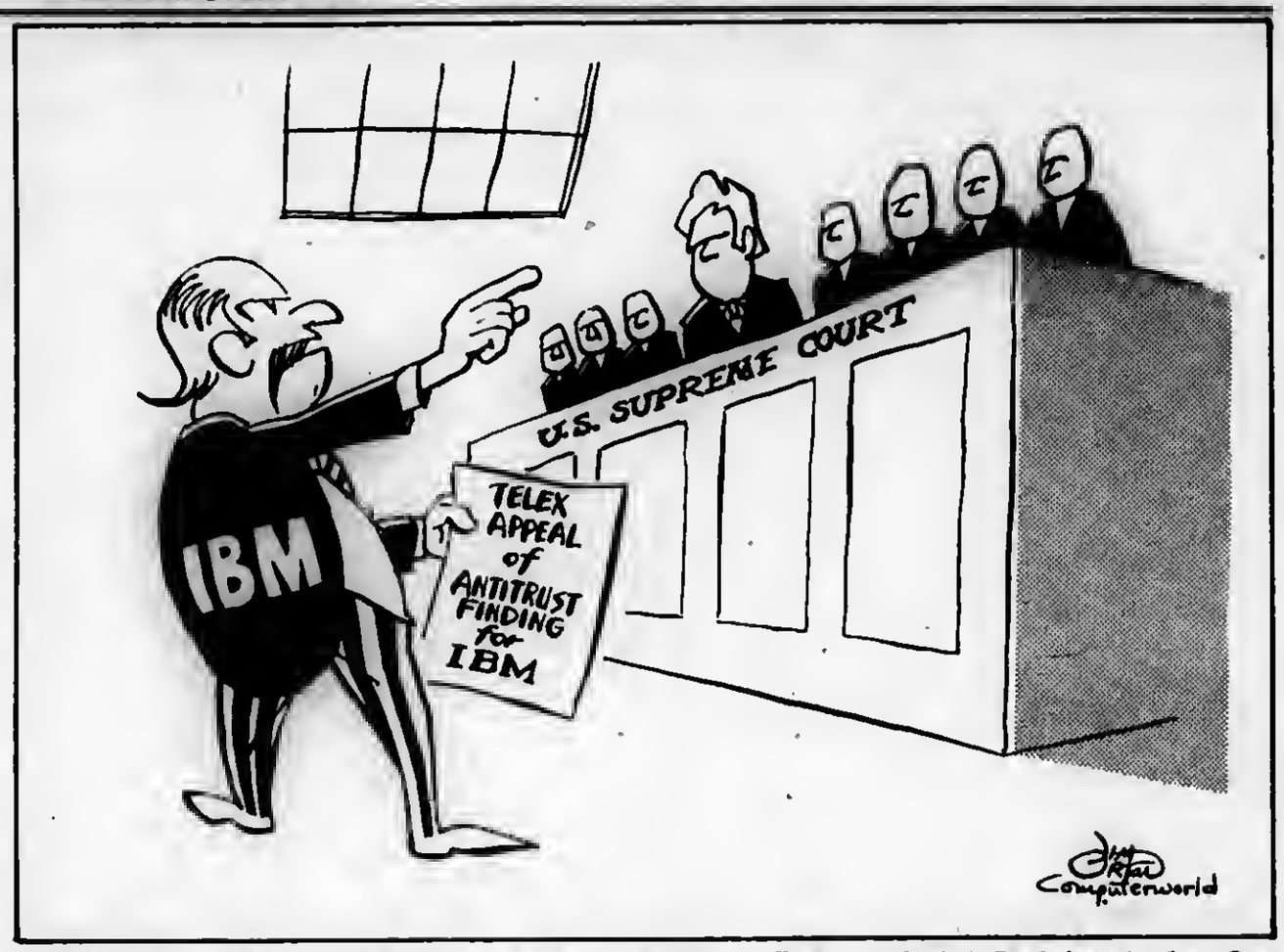
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Letters to the Editor

Editorial on 5100 a Disservice To Small User, Software Houses

The editorial regarding the IBM 5100 [CW, Sept. 24] did a great disservice to small business users and software houses alike.

The device is a microcomputer with add-on storage, an operating system and language interpreters to support two of the highest level interactive languages available today (APL and Basic). This is, in my view, a far cry from being "too specialized."

The statement, "This is actually a custom-tailored, problem-solving system best suited for complex environments," was not only a contradiction, but a critique few maxisystems could live up to.

The comment regarding the available software for the 5100 was bunk.

If "these capabilities [purchase analysis, forecasting, profitability analysis, budgeting, financial projection, etc.] are way beyond the needs of a small Cobol business user," something must be very wrong — either with the business user or with the editor's view of what the Cobol user should be doing.

A third possibility is that Cobol doesn't let the user do these analyses and projections as easily as an interactive system such as the 5100 would.

Classifying the 5100 and other machines as programmable calculators merely begs the question of what a computer is.

The capabilities of communicating with other devices and CPUs, of alphanumeric processing and of the storing of data and programs make it a computer in my eyes, regardless of how a user may actually utilize it.

Even the maxisystems started by supporting one user at a slow processing speed.

If IBM has avoided any impact of the 5100 on the small business user, this merely strengthens the position of us independents. This is because we have a service which does not compete with IBM, but nevertheless extends the bounds of their 5100 to include the small business user. This is a chance we should not pass up.

Bernard Werner

Edinboro, Pa.

Article Simply Free Advertising

The article entitled "Three Users Find SMF Inadequate" in the Sept. 24 issue was a cheap shot at IBM and a clever way for Whitlow Computer Systems to get free advertising. The lead stated SMF failed to do what it claimed to do, which is proven allegedly by three users' hardware monitors.

The article showed how much faster Syncsort was over the competitors' sort programs, etc., definitely a sales technique for Whitlow.

The closing of the article polished up the advertisement by throwing in the percentage of device time saved by using the Whitlow sort.

Good journalism should have weeded out this front page attention grabber.

Elliot S. Hamilton

Chicago, Ill.

Mini Used to Generate Fear

The article, "Passage of Abortion Law Credited to Mini Data" [CW, Sept. 17], boasted that Barbados has passed an abortion law as a result of the information generated by a minicomputer.

The painfully inhumane attitude of this article deserves a response. How can taking the life of another human being for any reason be considered just or good?

Our Supreme Court said the child in the womb is not a person; but they said the same thing about the black people in 1857 (Dred Scott Decision). Did the court decision make it just for the black salves to be subject to death and torture by their "owners"?

It is unfortunate the minicomputer was used as a tool to generate fear — a selfish, depraved fear.

David A. Fuller

Renton, Wash.

IBM Spending Cash on Real Estate

In reference to the article, "IBM Attempting to Diminish Embarrassing Cash Hoard," [CW, Sept. 17] one of the reasons IBM has only $4 billion in cash is it has been buying a great deal of real estate in the past few years.

Philip F. Burns

Wellesley Hills, Mass.

Programmers 'Hooked' on 3000

Congratulations to Charles Rice and Don Stoneman for an excellent accomplishment in extending their programming capabilities with their IBM computer ["Small Shop Builds Programming Palace," CW, Sept. 10].

For small users who would like to have the same type of capabilities in the $175,000 to $250,000 hardware price range, I would recommend the Hewlett-Packard (HP) 3000.

After a year of using the 3000 in the manner described in the article, our programmers are hooked. We didn't install the 3000 just to get a "programmer's palace," but that was certainly one of the things that came with it.

William L. Flack

Memphis, Tenn.

Internal Pressures

I've been asked by six people – three academics and three Japanese – to explain the phrase "internal pressures" that I use in describing IBM actions, especially as regards announcement of major new prdoucts and systems. It puzzled me a little to get the Japanese inquiries, because Japan is a very IBM-like country: the family-type commitmcnt, the necessity for final consensus, the great concern for appearances. I would have thought the decision processes involved would be very familiar there.

The messy politics and open power struggles in Academe are much different, but even there the prevalence of nonrational elements in resourcc allocation and support solicitation is a link to what goes on inside the incubator of All That Is Good.

You see, the normal profit-maximizing arguments don't really apply in IBM. A perfect example was the 360 announcement back in 1964: if they announced a radical new system, the stock would go up – "IBM again demonstrates its leadership." If they announced a compatible new machine (thc 7095) the PR boys would play Customer Concern on their kazoos. And if thcy announced nothing, the security analyst community would be encouraged to perceive the increased cash flows due to the extension of the 7000-series lease period! All choices led up.

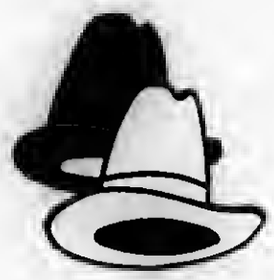
What happens instead of Adam Smithian economic calculations is a highly personal and, especially nowadays, nationalist power struggle. The development laboratory, the not-fully-occupied manufacturing facility, the executive who has not had a major success for some years contend in the arena for prestige and precedence. Not for survival: the Dutch engineers, the British software artists, the California veterans all will remain in IBM. But lower on the world totem pole; shipped off to some horrible location without a country club – or even, Poughkeepsie!

The parameters of that struggle used to be rather more unusual, in the eras of the Watsons. The Old Man was keen on physical appearance: the blue-suit-white-shirt syndrome, the clean machine area, an artistically arranged set of executive photographs.

Tom Junior was a yachtsman, and fellow sailors did well. Both mcn favored tall, impressive males and Doris Day females; Steinmetz would have done poorly in the development derby!

Today things are somewhat less intimate. The amount of money already spent on a project, the need for support from a foreign government, the enthusiasm that can be gencrated in a division or corporate-wide sales force are quoted in the management councils. An unusual photo safari or a major community-betterment project still counts, though; one reason it is so hard to get copies of the many company employee publications – the plant papers, the sales newsletters – is that IBM watchers and internal faction leaders can interpret "family" stories too effectivcly.

It's a salesman's world: highly personal, closely knit, gossip-ridden. And optimistic – very optimistic. The conservatism of thc circuit designer, the gloom of the accountant, the misanthropy of the lawyer have little influence; the desire to clobber thc competitors, to win 'em all, is dominant. If tools are available to achieve that dominance – a nonstandard input medium, an impenetrable software sccurity system, a radical new applications package, and, of course above all, a totally new computer family – well, those tools will be used. And it will be internal pressures, not the usual external ones, that govern. IBM internal pressures become *external* pressures on the Amdahls, the ICLs, the Texas Instruments; we all see that. But it is at the earlier stages, when still internalized, that forces within IBM bear close watching.



Herb Grosch

What About It, IBM?

Releasing Statistics Could Aid DP Fraud Prevention

An IBM corporate spokesman recently denied the accuracy of the reported 1974 DP fraud figures of $200 million [CW, Oct. 1]. The publication of the figure, which IBM called "unfortunate," allegedly came from a leak out of a National Bureau of Standards subcommittee.

The Taylor Report
By
Alan Taylor, CDP



Here IBM's manager of security, Robert Courtney, had conversationally mentioned he had 339 press reports, conversations with others and equally informal, unreliable entries regarding computer occurrcnces.

Courtney had no better information than that and never intended the figures to be published. So the spokcsman's story went.

Digging, however, suggested that IBM has got the wrong end of the stick and the $200 million figure is justified or understated.

Takc, for instancc, some of the statements Courtney made in his earlier Atlanta speech bcfore the Data Processing Management Association (DPMA) convention.

In the speech, Courtney appeared to be at least condoning, and perhaps positively supporting, the nonreporting of fraud cases.

"I am not suggesting you should report the rest of it," he told the audience, referring to thc 85% of the 339 cases he somehow knew had not been reported to law enforcement.

He also apparently knew crimes had been committed and criminals detected but not reported. That is not the type of knowledge one gets from reading press reports.

Perhaps $187,976,500?

Nor did Courtney tell the DPMA members the figures he quoted came from such unreliable data as press reports. In talking about the dollar figures, for instance, he said: "Of the 339 cases which I saw last year, the average takc was $554,500." Multiplied out that is $187,976,500 – nearly $200 million.

Indeed, he was quite positive he personally saw these cases. He used his seeing cases "as an individual" to differentiate his figures from those of actual computer-related fraud cases nationally. He argued frauds that are undetected or unknown to him made it impossible to estimate thc real figures. The 339 $554,500 figures, he insistcd, are simply the ones he as an individual saw.

Did He Exaggerate?

Now, it is possible Courtney exaggerated a bit in his DPMA speech. But it seems unlikely he could possibly have obtained the information hc had about the cases from the unreliable sources the IBM spokesman described.

For instance, take his attack on the internal auditors. Here is how it went:

"So what do we know about these frauds? Now I guess I'm not very diplomatic, and I don't mind saying too much. In all 339 cases that we saw in 1974 and in almost the same number in 1973, there was not one instance in which the internal auditors were in any way involved in catching these people or in warning management there was a potential exposure. To that extent, the auditors had an absolutely perfect record."

Now, press reports and conversations just don't entitle one to claim negative knowledge, i.e., that the internal auditors had *not* been involved. That type of knowledge is only available to insiders – to people who are able to investigate and ask questions about the fraud, even though it has not been reported to the Federal Bureau of Investigation.

In short, it simply wouldn't be available if the list were a collcction of raw random data, as IBM is now claiming.

> *"So we are left with the question of what to do in the future . . . That $200 million/year now turns out to represent only a portion of the frauds that are taking place. The real figure is much higher."*

And the DPMA speech also showed that Courtney actually knew more about these cases. He knew not only what the auditors were not doing, he also knew what type of technology was not used to carry them out, as well as where the culprits actually workcd.

This is another part of his specch: "What else do we know about those 339? . . . I do not know of any cases of real economic impact or serious opcrational upset as a consequence of a technologically elegant intrusion. Every one of the cases I know about were people that were doing rather simple-minded things. A high level of technical competence was simply not required. The vast majority of them were simply people misusing system resources they were already authorized to use.

Who rips off payroll? People who are authorized to modify or work with payroll. And who steals from accounts payable?"

Now that doesn't sound as though it came from someone who wasn't using reliable data. That sounds as if it came from someone who knew what he was saying.

So we are left with the question of what to do in the future, avoiding the question of why on earth IBM should now be trying to downgrade the $200 million fraud figure. That $200 million/year now turns out to represent only a portion of thc frauds that are clearly taking place.

The real figure is much higher. And it is realizing this fact that will make us aware of the high incidcnce of fraud and, hopefully, how to take action against it.

Thc community needs more information from people like Courtncy on a regular basis. His comments on thc use of structured programming, for instancc, are interesting on a technical basis now. How much more interesting they would be if he could report next Fcbruary that no structured programming applications had been included in the 350 detected frauds? Or even that 50 of thc 339 frauds might not have occurred under structured circumstances? Or that structured programming made no difference?

What the DP profcssion needs to combat fraud is the immediate releasc of the descriptions and statistics that Courtney has and that IBM apparently doesn't want us to believe.

What about it, IBM? Will you play the leading role in stopping computer fraud that you could by simply freeing analyses of detected fraud cases? It would greatly help everyone and wouldn't hurt you either.

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RAYTHEON DATA SYSTEMS RAYTHEON

New Fable Version Shows

Efficiency, Maintainability Equally Vital

By Jonathan Sachs
Special to Computerworld

I must take issue with Miles Benson's fable "Choice of Efficiency or Maintainability Subjective One" [CW, Sept. 10].

Benson's basic point – that either efficiency or maintainability can be of prime importance, depending on the application – is undeniable, but he made some assumptions as pernicious as the prejudices he was fighting.

To summarize the fable: Byron Iconoclast and Samuel Smoothdog were programmers at the Clever Devil Toy Co., which contracted to write a hardware analyzer for General MPG, a large automotive concern.

Byron started the job, but his behavior offended General MPG and he was replaced by Samuel in midstream. Due to differences between programming styles – and the unsuitability of Samuel's style to the task – the project was a total failure.

Byron wrote super-efficient Assembler code; he was happiest when buried in a nest of source listings and core dumps. Samuel used only high-level languages, wrote code that could be read like a novel and documented every move he made.

Each man's vices reflected the other's virtues. Byron's code was efficient but specialized; it had few comments and was never documented. Samuel's code was generalized and well-documented, but not too efficient. After all, "you can't ask a general-purpose man to service nanosecond-dependent interrupts," right?

Wrong.

An efficient program need not be unreadable, difficult to modify or even specialized. A generalized program need not be written in a high-level language or be slow.

When we write a program, we should choose positions on many scales, among them generality, language level and efficiency. Our choices interact, but they aren't lashed together into a single variable.

Yet many people fall into the trap of making a simplistic "Byron or Samuel" decision that has little chance of fitting the task at hand.

Two Sides of Mirror

Part of Benson's problem seems to be that he viewed Byron's and Samuel's bad points as somehow inseparable from their good ones. As common tendencies, their bad points may have been related to their good ones, but no one should have accepted them as immutable.

And that is what Byron's and Samuel's boss did. He cherished the two for their strengths, while their weaknesses were, well, catered to.

As a result, Byron and Samuel were like two sides of a mirror. It was a warped mirror, and neither side worked properly.

No one can be expert at everything, but anyone who claims to be a professional should be minimally competent at everything in the scope of his profession. At least he should realize when he's in water over his head.

That is most unlike Samuel, who, Benson placidly observed, was the last party to realize that a hardware analyzer can't be written like a payroll package.

Another Version

Let's consider a version of Benson's fable in which Byron was more diplomatic and didn't offend General MPG so much that he had to be deported.

He finished the analyzer and General MPG signed it off. After using it a while, the company decided to get faster disk drives for a few heavily used files and a two-channel controller for some of its tapes. This stuff increased its throughput by 40%.

Now General MPG's staff had to adapt the analyzer to the new hardware. When it looked at the source code, you could hear them howling in the next county. It was a rat's nest of self-modifying instructions, nonstandard linkages and humidity-dependent subroutines. Of comments, nary a one.

The analyzer couldn't handle a two-channel controller; after all, when Byron was around, there wasn't any!

No one could figure out how the analyzer found device addresses, so the staff patched in a new routine that checked every I/O event and fudged things so the analyzer didn't know the two-channel controller was there.

Next the staff changed the analyzer's device table to support the new disks. When it ran a test, the analyzer wiped the system residence pack and turned on the sprinklers in the tape vault.

It seemed the table didn't control device characteristics for the *whole* analyzer – just for the modules that could access it efficiently.

The staff poked around some more and found the disk arm seek tracer was written around assumptions that, for the new disks, were just not true. After weeks of trying to figure out the tracer's connections to the rest of the analyzer, it called Clever Devil back in.

No Help at All

Clever Devil wanted to help, but it couldn't. Byron had moved to Alaska and no one else knew how the analyzer worked. Byron being Byron, there was no documentation.

General MPG gave up trying to monitor the new disks and patched the analyzer to ignore them. Then it ran – sort of – but it never produced useful output again. Despite General MPG's best efforts, the tape drive patch made it so inefficient that it couldn't keep up with the system.

So Byron killed the project just as dead as Samuel. He just killed it a little slower. Clever Devil escaped legal liability, but it won't be likely to get another contract from General MPG.

Two Morals

This fable has a couple of morals. First, the job was one where maintainability was just as important as efficiency. Byron killed it by failing to grasp that, just as Samuel killed it by failing to grasp the converse.

Second, Byron's "efficiency" at the expense of maintainability was self-defeating. After a little exposure to the real world, his program turned out to be neither efficient nor maintainable.

Byron and Samuel can't be blamed. If anyone can be blamed, it's their boss, who kidded himself into thinking he had a couple of genius programmers when he really had only two halves of a programmer.

Reader Commentary

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Accrediting DP Centers Would Ensure Data Integrity

By Douglas A. Webb
And Robert P. Abbott
Special to Computerworld

Because of the new Privacy Act and the Freedom of Information Act, greater emphasis will be given to ensure data integrity in DP installations, that is, to ensure data is accurate and has not been altered, disclosed or destroyed.

But how is data integrity measured? Who says an installation's data is protected? How can DP managers, government agencies and private citizens measure the capability of an installation for protecting data from misuse?

One approach to answering these questions is through accrediting computer centers for data integrity.

Accreditation is a means of determining the level of data integrity a computer center has, as measured against a stated practical norm – a norm beyond that which says no one can misue a data bank.

Accreditation is not a method of establishing a yes/no 100% answer to the question of a computer center ensuring data integrity. The accreditation approach is an attempt to have technically competent professionals make meaningful statements regarding the level of data integrity providcd.

We suggest an accreditation commission, similar to the Joint Commission on Hospital Accreditation, be formed to perform the following functions:

- Supervise the production of a data integrity norm of computer centers by establishing the general principles, objectives or goals of computer center data integrity; setting standards that support and define the principles; and developing interpretations and guidelines that explain and give practical examples for applying the principles and standards.
- Monitor thc data integrity provided by computer centers through establishing a formal accreditation methodology and performing accreditation surveys and reporting the findings on an ongoing basis.

The accreditation commission can be formed through action by either Congress, government agencies or the data processing industry. The members of the commission need to be DP professionals. This will help ensure the data integrity norm is meaningful and the reviews are performed by peers.

Reader Commentary

The principles, standards and interpretations of the accreditation process can be modified periodically as times and needs change. The commission would solicit opinions and recommendations from various government agencies, DP societies and consumer advocate groups.

The accreditation commission can assign capable people or go themselves to visit an installation and make an evaluation of the data integrity provided by the site.

The evaluation survey is made relative to the established norm. This norm is defined in terms of general principles, supporting standards and specific interpretations.

The installation can in part set the level of accreditation as they deem necessary and define the need for data integrity. Some aspects will be set by others – the commission, Congress, individuals, the National Bureau of Standards (NBS) or the industry itself.

The period of accreditation could vary from daily examinations to one every two to five years. This will depend in part on the installation as will setting the level of accreditation.

Auditing by CPAs

Formal auditing by certified public accountant (CPA) firms serves a somewhat similar function to the accreditation process. CPA firms give opinions on the accuracy and fairness of the financial reports of companies. The CPA report or opinion is a statement made by a recognized, capable and competent firm attesting that they have examined or audited a set of listed items, made the examination in accordance with generally accepted auditing standards, included necessary tests of the items and reported any items that do not conform with generally accepted accounting principles.

The notion that a CPA firm is certifying items implies a legal responsibility, and this aspect is conspicuously absent in accreditation. However, there are numerous useful ideas and procedures in the field of auditing that could be applied to the accreditation process.

Precedent for Accreditation

There is an established need with the new Privacy Act and the Freedom of Information Act to implement some form of evaluating or measuring data integrity within computer centers.

There is also an historical precedent for a commission-type of accreditation. Specifically, mandatory accreditation was imposed on hospitals by the Medicare Law.

The approach is flexible; it could be voluntary to some, mandatory to others. It does not have the stigma or real problems of legal requirements; that is, it can be modified without a lot of red tape.

The standards apply to all installations, but both the methods and the accepted level of meeting the standards will vary.

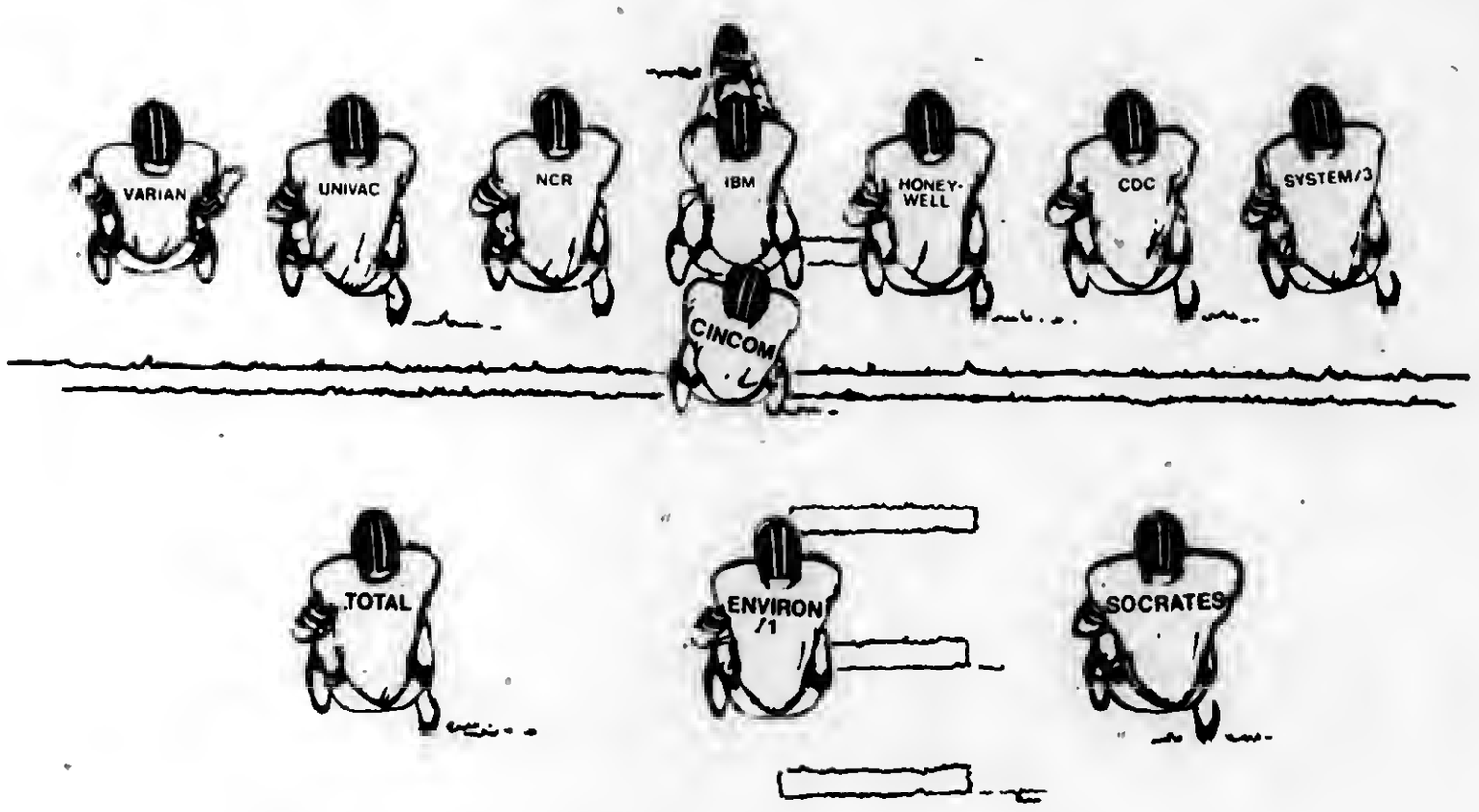
Installations will find the approach provides a useful index for evaluating their level of data integrity. A systematic evaluation by a peer group shows an installation has collaborated to seek excellence, accepted outside appraisal and demonstrated conformance with professionally developed and nationally applied criteria.

Numerous areas require attention before accreditation can become a reality. First, levels of accreditation must be determined. Then the costs for each survey, for implementing necessary recommendations and for maintaining data integrity must be identified.

Next, the principles, standards and interpretations to be used at installations must be set. A formal methodology for implementing these needs to be established.

Finally, a statement of accreditation must be prepared, and those who will make up the commission and who will make surveys can be appointed.

On the staff of the Lawrence Livermore Laboratory, Webb and Abbott conducted a study of accreditation for the U.S. Energy Research Development Administration under a project titled "Research in Secured Operating Systems."



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CW at CPEUG

About 130 people from government, industry and the academic world attended the 11th meeting of the Computer Performance Evaluation Users Group (CPEUG) in Oklahoma City last month.

Topics covered included everything from getting started in evaluation work to discussions of the relative merits of various statistical analysis methods.

Copies of the proceedings of the 11th meeting, as well as a number of papers from earlier CPEUG meetings, are available for $6 (prepaid) from John F. Wood, National Bureau of Standards, Building 225, Room A247, Washington, D.C. 20234.

CPEUG Keynoter Warns

Studies Must Be in Management Terms

By Don Leavitt
Of the CW Staff

OKLAHOMA CITY, Okla. – Politics and personalities are just as important in effective computer performance evaluation (CPE) projects as technology, according to the U.S. Air Force associate director of data automation.

Keynoting the 11th meeting of the Computer Performance Evaluation Users Group (CPEUG) here last week, James H. Burrows said CPE is made up of "three Ms: measurement, modeling and management.

"It's always been a disappointment to me that most of you forget the last one. You know a lot of the technical aspects of your jobs but you just don't set the stage to help your managers," he told attendees.

"Until you can find ways to create a real understanding of what you're doing – or trying to do, you'll still be an outsider when those managers need you," he warned.

"Unless you people learn to work with management, you'll remain an expensive and questionable factor. Right now, you've got a nice little playpen," he commented, "but it won't last if the boss doesn't know what you're able to do for him."

Measurement Not Enough

Measurement by itself can't help the manager, according to Burrows. Currently, hardware monitors with the facilities users really need "cost at least $100,000 and most DP shops just can't afford that kind of money."

Even if an installation can afford a monitor, there just aren't enough people around with the technical skills for every installation to utilize such equipment, he added.

Software measurement routines are also limited in their value, Burrows went on. Job accounting and billing facilities are among the most common of these tools, but "they've got to be more rational than they are now."

The Air Force has a wide range of CPUs, and a standard billing mechanism that would apply from one type of CPU to another would be very helpful, he said.

Beyond that, however, consistency should be a benefit to all users, Burrows added.

Users in meetings such as CPEUG's have a very difficult time talking to one another if they use different CPUs because of differences in measurements built into their software systems, he noted.

"Honeywell has far more precise data on I/O than IBM," he said, but other "stuff" Honeywell collects "doesn't make any sense at all."

Even a single vendor will often alter the accounting algorithm from one release of an operating system to the next, the Air Force spokesman continued, "and when that happens, a user can't even compare data collected last month with data collected today."

Modeling's Own Jargon

Even if the measurements are consistent and useful in the technician's eyes, "How do you make yourself useful to the manager between mainframe upgrades and configuration modifications?"

Modeling is a useful CPE technique, he

(Continued on Page 18)

Special Software Keeping Bell Tuned

By a CW Staff Writer

OKLAHOMA CITY, Okla. – Commercially available software monitors are good measurement tools, but Bell Telephone Laboratories also uses hardware monitors and some "very specialized software monitors" to keep its IBM, Honeywell and Univac equipment well tuned, according to J. Michael Jenkins, head of the lab's Systems Analysis Department.

Some of the special monitoring routines were developed to learn about systems in general and to try to get a feel for what was really going on inside the blue box, Jenkins explained to a general session of the Computer Performance Evaluation Users Group (CPEUG).

A program called Systems Analysis of Virtual Operating System (Savos) was built "almost as a toy" to gain a better understanding of IBM's VS environment. Savos mapped users' Virtual Storage, showing which pages were moving in and out of real memory, which were in V=R, and which were operating system pages.

Samples were taken once a second, and the collected data was posted to magnetic tape. It was then processed through a computer output microfilm (COM) device modified to produce movie film.

When the movie was run – eventually at a slower than sample pace – the pattern of movement in Virtual Storage was vividly evident. At the meeting Jenkins showed clips of the mapping done on an overinitiated IBM 370/145 which was thrashing badly and of a stabilized 370/158 with a spectrum of service capabilities, handling them all well.

Graphic Output

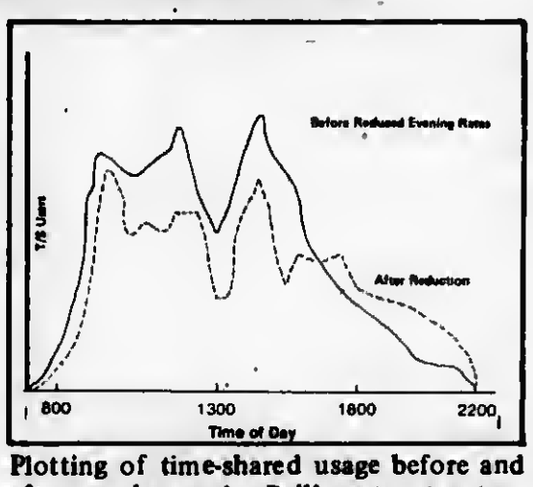
Another software system reduced workload statistics to graphic output, and the pictures Jenkins presented included the load throughout the system's day. The classic peaks and valleys were there, with sharp falloff after 6 P.M.

A change in the billing algorithm caused a decided drop throughout the prime shift and "a very satisfying" increase in evening usage, all of which was documented with the special monitor software.

The user initiated moves to the evening, and a drop in games being played was enough to delay a system upgrade for "about two years," Jenkins said.

In another instance, tape drive usage was monitored and graphically reported, providing management with an immediate awareness of very heavy use between 11 p.m. and midnight every night and com-

(Continued on Page 20)



Plotting of time-shared usage before and after a change in Bell's rate structure confirmed success of strategy to move users into nonprime time.

NBS Mulls CPE Manual for Univac 1100/Exec 8

By a CW Staff Writer

OKLAHOMA CITY, Okla. – A working group at the National Bureau of Standards (NBS) believes there is a need for technical manuals of computer performance evaluation (CPE) information for the major systems, and the structure of one such document – for the Univac 1100 Exec 8 operating environment – has been processed.

This particular project is still at the feasibility study stage but, if it succeeds, NBS will then "hopefully" produce comparable manuals for other systems, according to Dr. Robert S. Butler of the bureau's Institute of Computer Science and Technology.

Butler focused on the Univac 1100 series first because NBS has an 1108 which is useful as a testbed for the concepts and techniques to be covered in the manual.

Beyond that, he added, the Univac 1100/Exec 8 represents a "typical third-generation system that is popular in the Federal government, but not widely studied using CPE techniques."

Butler told a technical session at the Computer Performance Evaluation Users Group meeting here recently he would welcome comments and CPE studies on Exec 8 systems from Univac 1100 users anywhere, especially material related to job accounting analysis and measurement software that users have at their own installations.

'Not a Cookbook'

The manual "will not be a cookbook" in the area of CPE for even one line of hardware/software systems; it will, instead, be a compendium of approaches and techniques that have been tried and found useful, Butler said.

But the user will be left to choose what parts of the books, if any, are applicable to a particular situation, he added.

The manual, whenever it may be published – and "that's very much up in the air right now," Butler admitted later – will start with a discussion of alternative approaches to CPE, regardless of what system is studied.

A general methodology for computer performance improvement will be proposed, the NBS spokesman noted.

The next section, on evaluation criteria, will define performance criteria in terminology specific to the Exec 8 system. It will propose working definitions for parameters such as throughput, response time and resource availability, he went on.

(Continued on Page 19)

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Simple CPE Strategy Avoids Upgrade at USDA Center

By Don Leavitt
Of the CW Staff

OKLAHOMA CITY, Okla. – The simplest strategy for getting into computer performance evaluation (CPE) is to "start at the beginning and move up," according to the analyst who did just that at the U.S. Department of Agriculture (USDA) data center in New Orleans.

With this approach – and the strength of his position on the staff of the center's director – Richard T. Eckstein has been able to sharply increase the workload of the center's IBM 360/65 without saturating the system.

And an upgrade to a 370 which seemed inevitable 18 months ago has been indefinitely delayed, he told a session at the Computer Performance Evaluation Users Group meeting here recently.

Increased hardware costs have not been completely avoided by Eckstein's analysis of the system. There have been significant configuration changes, but more important – in his eyes – have been the great changes in attitude of the personnel at the center.

In early 1974, when the system appeared to be saturated, it was logging 160 productive CPU hours "and just couldn't do anymore."

Now the staff members work all month long to push the system as hard as it can. It anxiously waits for posting of the month-end "stats" to see how close it's come to the 307 productive CPU hours Eckstein now believes is the modified system's saturation point.

CPE should start, he maintained, with an understanding that reports on the number of jobs entered into the system, the amount of time needed for turnaround by job type, the number of system crashes, the amount of idle time within initiators, the number of tapes mounted and the number of hardware crashes can all be helpful.

All this data is available under IBM's OS. Making a "simple modification" to the operating system, the console log can be written out to tape, he explained,

CW at CPEUG

allowing almost all of these reports to be generated on the computer with a fairly simple data reduction program.

Job Accounting Routines

Another area for collecting data about performance is in the system's job accounting routines, he went on. Information on CPU utilization is available there, and so is the amount of time, core and other resources utilized by job, group of jobs or a system.

At the USDA data center, the CPU use report quickly showed the effect of a change in the overall system while the listing of number of jobs and total time used, by class, gave Eckstein a clear indication of where a bottleneck was before the system was tuned.

In attempting to gain faster service, most users had called for the same range of high priorities for their own work. A restructuring of the class structure and application of dollar costs for core used helped smooth out that situation, he said.

After analysis of accounting data, software monitoring can be used to give details of the internal operations of the operating system and of the application programs.

These tools do impose some overhead of their own, however, so they are not used for extended periods of time, Eckstein commented.

Hardware Monitoring

Hardware monitoring is the next step in the analyst's approach to CPE. The data collected through external probes into the hardware circuitry imposes no overhead and can be usefully displayed on a Kiviat graph form so that general management can easily visualize changes in the basic operation of the system. .

Once the staff and upper management have been brought up through all those stages of CPE potential, they should be ready to comprehend the concepts and the possibilities inherent in modeling and simulation, Eckstein said. It is too late to use this range of tools once a system is saturated if the goal is analysis of cost vs. performance.

But modeling/simulation can save time and money in determining the effect of hardware and software developments before they have been implemented. Such studies may, for example, show clearly the cost of a proposed change cannot be justified by the best possible performance improvement it can provide.

Mistakes in unjustified hardware or software modifications can be extremely costly and are best avoided, Eckstein reminded the group.

Talk to Managers, Keynoter Cautions

(Continued from Page 17)

went on, but it has a jargon all its own.

"Does your boss understand your models? Do you, if you're really honest with yourself? Is it the simplest it could usefully be? Is it accurate?" he asked.

The folklore of data processing is faulty, and each area within DP seems to have its own misconceptions, he said. Many managers still seem to think that the more jobs on a system, the faster the system will run.

Who but those in CPE can get rid of that misconception? Burrows wanted to know.

It is true, he acknowledged, that "most systems could do at least one and a half times more work than they are now just with proper scheduling."

On a more detailed level, he asked, "who checks programmers' code to see if it runs well? Is it checked in isolation, or in conjunction with everything else that may be running with it?"

Rewriting systems can't be done – effectively – without considering the rest of the workload, he said. In one case he knew, a job that took 17 days to run in batch mode was rewritten to go on-line with CRTs "to speed it up."

The new version took six months to run, Burrows noted.

The effectiveness of a CPE group is often pegged to its place in the organization. If it only reports to the head of DP every six months, it will have no real impact, Burrows said.

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Sponsor Pondering New Segments

Non-DP Students Affecting Direction of CPE Classes

By Don Leavitt
Of the CW Staff

OKLAHOMA CITY, Okla. – About 500 managers have been through a one-week course on computer performance evaluation (CPE) offered by the Department of Defense Computer Institute (DODCI). But the makeup of the student body and the course content keep changing, according to the course coordinator.

The course was organized three years ago. It is open – without cost – to people working for Federal, state or local government agencies or for organizations having contracts with government agencies, Terrance M. Losonsky told the recent Computer Performance Evaluation User Group (CPEUG) meeting here.

The original students came from senior-level technical DP environments. Currently, however, there is increasing interest and enrollment among non-DP specialists such as auditors, project officers, contract monitors and management information specialists.

And that shift probably is a good thing, Losonsky indicated.

On the other hand, the shift in student makeup and "a suspicion DODCI's dependence on guest lecturers may cause some of them to get 'burned out,' " has left him with a feeling the course content needs further "tuning."

Refresher Course

The first morning focuses on computer system architecture. A refresher course not directly on CPE, it covers multiprogramming, multiprocessing and queuing theory, Losonsky explained.

A session on the use of accounting data for performance management, after lunch, was designed to make the students aware tools are easily available and to show what the results of using these tools can be.

The first day ends with a discussion on the framework of an analysis effort. This segment of the course emphasizes there has to be a goal before any measurement work has any useful purpose, he said.

The second day starts with a session on hardware monitors. A "real gutsy, detailed where-the-probes-go" segment, it is very popular with the general management-level students, Losonsky noted with a sense of surprise.

The rest of that day covers benchmarking, including synthetic benchmarks; ways of presenting CPE data and conclusions to management; and techniques for optimizing program source code.

The third day opens with a session on software monitors, then moves into a discussion period on actual CPE experiences in the Army. This is designed to show the students some of the good – and bad – things they may encounter when they apply the techniques they have studied.

Simulation of computer systems is covered the third afternoon and this has had mixed reactions from the students, Losonsky said. The general managers seemed unimpressed; the technicians liked it, he said.

Marine Corps instructors have covered interpretation of performance monitoring data on the fourth morning. As a case study, students are given the goals of a CPE effort and data collected, after which they draw their own conclusions.

CW at CPEUG

Common sense techniques for improving computer performance – the next portion of the course – varies with each class. This is one of the blocks of instruction that may temper possible overenthusiasm for the more elaborate techniques, Losonsky noted.

The payoffs of using operational analysis and configuration management techniques and the subtleties of managing computer performance take up the remainder of the fourth day and the start of the fifth day.

Consideration of the capabilities and facilities of the Federal DP Performance Evaluation and Simulation Center (Fedsim) mark the end of the course material by noon on the fifth day.

Such a brief course might be the "little bit of knowledge" that would make the students "dangerous" when they return to their normal jobs, Losonsky told CPEUG. But cost justification is expected to be part of each presentation, to keep the students "in touch with reality," he added.

NBS Mulls Manual On Univac Tuning

(Continued from Page 17)

From there, the proposed manual will go into performance improvement options "and it is this section that emphasizes our belief it is impossible to write a useful 'cookbook,' " Butler said.

"There are simply too many variables: different configurations and workloads, local modifications to the Exec and different releases of the operating system.

"The best we can do is to identify a number of options and suggest a method for choosing among them," he said.

To help organize a user's thought process, the option section will be subdivided into considerations on hardware, the operating system, data center operations and application programs.

Measurement Facilities

The next section – on measurement facilities – will discuss observation, accounting log systems, software and hardware monitors and workload drivers, Butler continued. In all cases, he emphasized, generally available tools will be specifically named and discussed. Procedures for validating each tool will also be given.

In the analysis section which will follow "Measurement," available simulation, analytical and statistical tools will be discussed in detail, according to Butler.

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DP Needs Sense of 'Contribution, Not Mystique'

By Don Leavitt
Of the CW Staff

OKLAHOMA CITY, Okla. – Computer usage has sufficiently matured, according to George L. Whalley, "to begin steering away from technology toward greater efficiencies, improved performance on what we have, and to begin developing a general philosophy of contribution rather than mystique."

Deputy director of the Office of DP Operations at the U.S. Department of Housing and Urban Development, Whalley told the recent Computer Performance Evaluation Users Group (CPEUG) meeting here there is much to be learned by the DP community in communicating its performance and importance to the real leaders in organizations – those "who have no patience and little time for technical tutorials."

Establish simple objectives, he urged the technicians, and put them in simple terms: "Reduce computer downtime by 10%, train 20 people in advanced scheduling techniques, reduce time lost to abortive processing by 25%.

"Your boss will understand these objectives and you will have your accomplishments – or lack of them – measured," Whalley went on.

CW at CPEUG

Formulate Philosophy

More useful than simple objectives, however, "there should be set down a philosophy of operation which lends itself to distinct steps toward better performance, and which is known and understood by all employees at the DP activity."

In his own operations, he said, he has established some categories of effort which he hopes "will move us toward our goal of a model computer center."

Such a goal demands, first of all, that the center have the right equipment, a suitable environment, workable operating standards, adequate procedures and complete documentation.

In order to provide services – "rapid data entry, timely processing, quality products and responsiveness to situations" – the center uses certain techniques to maximize use of all resources, minimize abortive processing and conserve expenditures.

Internally the center must have the ability to modify its own organization, to change equipment, to overhaul the facility and to get systems redesigned.

This should, in turn, generate certain attitudes among the center's "customers": satisfaction with service, confidence in the center's capabilities and respect for the talent that is there.



Thanks

William J. LeTendre, outgoing chairman of the Computer Performance Evaluation Users Group, received a wall plaque for his years of service to the group at its recent meeting in Oklahoma City. LeTendre is a technical advisor with the U.S. Air Force's Electronic Systems Division.

Specialized Tools

Keeping Bell Tuned

(Continued from Page 17)

paratively little activity on these devices during most of the day.

A quick review of operations room procedures showed the heavy use was caused by the copying of disk files for backup protection. By convincing the operations staff to spread this activity throughout the day, the peak was cut back and two tape drives were eventually released as excess, he said.

In yet another situation, one of the Bell System's data centers seemed to be having a breakdown in throughput, he went on. Jobs that logically should have been done within hours were at the center overnight, and there was considerable thought given to getting a new system.

In fact, IBM's SMF showed the jobs were only taking 20 minutes in the computer itself. The problem then was identified as one of human factors and not of equipment.

Some problems are not solved that simply, however, and Jenkins also described a dynamic job scheduler Bell developed for its own use.

It isn't as accurate as some of the schedulers commercially available, he admitted, but it serves a different purpose.

Most shops can schedule – accurately – what needs to be done in the next scheduling period, he said, but the lab's situation "isn't stable for more than two and one-half hours at a time."

But the scheduler tracks what was supposed to have been done up to the point trouble occurred and what was done. It then considers what is left over and what else should be done in the next period.

"But it is a recovery tool, not a long-term scheduler like the commercial packages," he said.

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COMMUNICATIONS







CW at TCA

International Communications Corp., Atlantic Researeh Corp. and Codex Corp. showed technieal eontrol eenters at the Tele-Communieatlons Association (TCA) exhibltion. Other vendors who showed data communieations test equipment included Collins, ADC Telecommunieations, Speetron Corp., Cooke Engineering Co. and Infotron Systems Corp.

Specialized Carriers Cost Less But Start-Up Problems Do Exist

By Ronald A. Frank
Of the CW Staff

SAN DIEGO – Initial experiences with the new specialized carriers do produce start-up problems, but in the long run the user saves money and the service is usually good.

This was the consensus at a user panel on these carriers held at the recent Tele-Communications Association (TCA) Conference. The users agreed initial delays after service was supposed to start had been a problem.

Valley National Bank of Arizona has a 2,400 bit/sec line provided by Southern Pacific Communications Co. (SPC) between Tucson, Ariz., and Phoenix to Texas, according to Jean Blodgett of SPC. SPC provided this facility with independent modems at $300/mo less than the local phone company had bid.

Due to snowstorms, shortages of personnel and other problems, there was a three- to four-month delay in getting the Texas end of the link into operation, she said.

In addition, when DP staff members from the bank visited the local SPC site, they found there was not adequate 24-hour security to protect the transmission equipment, she told the attendees.

These problems were corrected and, after a year of operation with the carrier, the bank is satisfied with the service, she said.

Jim Palmer of Crown Zellerbach Corp. said his company initially expected to save about $6,000/mo by switching certain lines in its corporate network to SPC.

The actual savings were about $300/mo more than Bell high/low rates, but only after some problems were overcome.

Initially each local phone company would deal in its own manner with representatives of the specialized carrier, Palmer said. But this has been corrected since Bell established uniform operating procedures for dealing with all new carriers.

Since the specialized carrier provides the user with an end-to-end service, it must interface with the phone companies for local loops and other interconnections, Steve Ernst of Bank of America explained.

To avoid problems, the user should provide the specialized carrier with a letter authorizing the new carrier to act as agent for the user.

One user attending the session said the wording of the letter can be important. His company is served by a Bell national account manager. After the user wrote the agency letter, the manager said service would have to come from the local level because the agency letter had eliminated the customer's national account status.

Even though the user selects a specialized carrier, he should not abandon the phone company, Ernst advised. The user should call the phone company to work out an emergency backup plan in the event that the specialized carrier facilities fail.

Many phone companies will be reluctant, but they must work with the user since they are operating in a regulated environment and have to provide service, Ernst said.

If users keep a well thought-out backup plan in their desk drawers, they will avoid a lot of problems if a major disaster should occur in the specialized carrier link, he said.

Sharing Lines

Users who are considering specialized carriers should inquire about the possibility of sharing the lines with other users to save money. The specialized carriers are more flexible about this type of thing than the telephone company, but often the salesman does not know about all the possibilities, he said.

When asking for a proposal from a specialized carrier, the user should ask for a complete description of the facilities that will be provided, including the points of interconnection with other carriers, Ernst said.

All the users agreed points previously taken for granted when dealing with the phone company must be specifically spelled out so the specialized carrier knows exactly what facilities and service are to be provided.

Hierarchical Networks To Benefit From SNA

By a CW Staff Writer

SAN DIEGO – IBM's Systems Network Architecture (SNA) will provide users with a way to transfer many jobs previously performed at the host mainframe to other levels in a hierarchical network.

And this type of data communications system structure is the direction of the future, according to Chauncey Bartholet, director of communications products at IBM.

The need for multiple interrelated processors is going to be with us for a long time, Bartholet told attendees at the recent Tele-Communications Association (TCA) Conference.

Many organizations will insist on multiple CPUs based on principles of divisional autonomy or system backup. And some data communications networks using specialized networking solutions with modified system software and hardware have already been created by his company, he said.

(Continued on Page 22)

Users Would Gain Under AT&T Restructure: Hellerman

By a CW Staff Writer

SAN DIEGO – If AT&T is forced to restructure itself as a result of the Justice Department antitrust suit, it "will result in better equipment and service for the consumer and at lower costs."

But, even if the case proceeds fairly rapidly for an antitrust case, it will take five years to reach a decision, assuming the case is not dismissed, according to Gerald Hellerman, special financial advisor to the Senate Antitrust and Monopoly Subcommittee.

As a result of hearings held by the subcommittee, the chairman, Senator Philip Hart, introduced the Industrial Reorganization Act, Hellerman told the annual meeting of the Tele-Communications Association (TCA).

If passed, the bill would add two important "wrinkles" to antitrust enforcement procedures.

"Trustbusters would no longer have to rely on evidence that defendant firms intended to create monopolies to control prices or exclude competitors," he said. Under the bill, a firm could be judged by the result of its actions instead of its intent.

And the antitrust system would for the first time deal directly with the mechanics of restructuring monopolies such as AT&T, instead of being limited to dealing only with fines and injunctive relief, Hellerman said.

The proposed Hart bill and others now pending are designed to foster competition instead of regulation. "Regulatory agencies often stifle or restrict competition more than they foster it . . . they . . . have become servants of the industries they are supposed to regulate," he said.

User Involvement Urged

Despite the antitrust effort against AT&T and the proposed legislation to make antitrust enforcement more effective, users cannot afford to become complacent.

Hellerman urged users to get involved and "let the Federal Communications Commission (FCC) know that its decision so far – in allowing some loosening of the telephone company's grip on this industry – has been beneficial for your companies, their customers and the public generally. Encourage the FCC to speed up the process. This is not the time to be reticent. Communicate."

Hellerman said the Hart bill had resulted from two series of hearings held on various industries. Hearings on the communications industry had helped, and users who appeared to testify had given valuable input, he said.

Although many users were ready to speak in public about customer abuses of the telephone company, there were others who gave information but preferred to remain anonymous.

Another speaker at the session was Robert Ross, an attorney for the Office of Telecommunications Policy (OTP) who said his office was investigating the privacy aspects of electronic funds transfer systems (EFTS).

"The potential for abuse of such systems lies in the possible erosion of accountability for the maintenance of integrity of an individual's records," Ross said.

An even greater danger lies in the potential secondary uses of EFTS data. This information could also be used for surveillance and "social control" purposes, he warned.

"Every time you make a credit transaction, you leave electronic footprints telling where you have been and what you have been doing," he said. OTP believes it is necessary to address these questions now, even though the EFTS industry is in an infant state.

OTP is dedicated to increasing competition rather than regulation so that users will get a greater variety of services available to them, Ross said.

In the value-added (packet-switching) area, OTP favors open entry as opposed to having users served by regulated carriers operating under tariffs, Ross said. "OTP finds no legal or economic justification for regulating" such services, he said.

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Users of Hierarchial Networks To Derive Benefits from SNA

(Continued from Page 21)

SNA was designed to provide a single uniform environment for data communications users. And just as the IBM 360 architecture was carried over into the 370 family, SNA "may well outlive the hardware and software that represent its current announced implementation," Bartholet predicted.

SNA provides an environment in which applications can be designed to execute partially in the mainframe and partially in a terminal controller. This ability to process user application code in terminal controllers "can significantly reduce loads on the CPU while keeping systems control at the central site," he said.

In addition to providing management with distributed functions, critical remote processing capabilities can remain active even if the central computer fails. Interactive applications can be designed so controllers can process some requests and the CPU other requests.

Using this distributed capability, average transaction response time at the workstation can be reduced because some requests can be handled outside the central processor, Bartholet said.

Aids Problem Isolation

Common connections between system elements in an SNA network allow fixed points of reference against which to measure diagnostic output, aiding in the isolation of system problems to a specific point of failure, he said.

Because each network element has its own area of system responsibility, modifications to the system are usually isolated to a single element.

The addition of a new line need only be reflected in the Network Control Program (NCP) to which that line is attached, Bartholet said. The addition of a new user application program which will use the data communications network need only be reflected as an added resource to the Virtual Telecommunications Access Method (Vtam) control program. And every application program can be isolated from physical problems which occur in the network, he explained.

Additional terminals can be introduced into a network in a simple manner so a user can judge a workstation on its functional merits without fear that the installation will require extensive change to existing application programs.

In the future, a generalized networking system will be needed in which any terminal in a network can connect dynamically to any application in any processor in that network, Bartholet said.

Such a system would allow any kind of CPU, terminal or line control to function in the network. This might well include provisions for distributed operating systems and distributed synchronized data bases.

Ad Hoc Solutions

SAN DIEGO – "Today's proliferation of data communications software, data link protocols and general-purpose terminals reflects the hectic and widespread search for ad hoc solutions which characterized data communications in its infancy," IBM's director of communications products, Chauncey Bartholet, said at the recent Tele-Communications Association Conference.

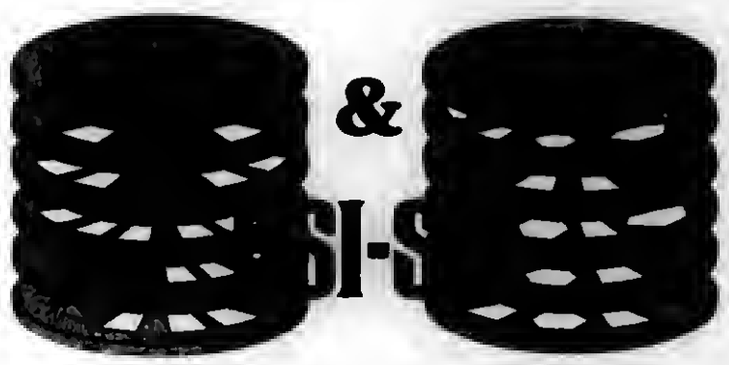
Most of the current hardware and software products are basically incompatible. Most batch terminals and most CRT terminals cannot coexist on the same communications line because of data link protocol differences.

And lines are frequently dedicated to a single terminal type controlled by a single communications control program, Bartholet said.

Each time a user modifies a communications control system, he runs the risk of causing an old function to fail while trying to implement a new function. These dedicated resources raise the cost per terminal and discourage an organization from extending its data communications into new areas, he said.

As a result, today's communications networks are built around single applications. And, duplicate networks, each with their own terminals and multiple communications controls systems, are common.

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Terminals Outfitted for Disabled

By T.M. Whiteman
Special to Computerworld

CALGARY, Alta. – Physically handicapped persons, under the guidance of a group of researchers at the University of Calgary here, are operating computer terminals with the help of special equipment.

The equipment, dubbed Possum, was originally designed in England for typewriters and telephones and consists of a variety of interchangeable hand, foot and head controls.

One terminal equipped with Possum is currently being used as an instruction aid for students with physical handicaps.

Each of the available controls has two settings. Controls include, for example, a stick shift which can be moved to the left or right; dual rod controls; a large hand switch with two large, flat buttons; a foot switch; a head control operated by moving the head to the left or right; and a long tube-shaped pneumatic control, operated by either inhaling or exhaling.

By moving the control to the first setting, the operator can move a light horizontally across an 8 by 8 matrix. By moving it to the second setting, the light can be moved vertically on the matrix.

To select a particular character, the operator uses the control to move the light horizontally and vertically on the board until he reaches the character. When the first movement is repeated, the light returns to its home base.

According to the researchers, the Possum indicator board offers an advantage over other regular typewriter keyboards because the number and placement of characters can be tailored to a user's program requirements.

Lear Siegler Adds Modular CRT For Business Transaction Points

ANAHEIM, Calif. – A three-element modular display terminal has been introduced by Lear Siegler, Inc.

The ADM-2 display has been packaged especially for the business transaction point, such as banks, airline ticket counters and other environments where the clerk must enter and retrieve computer data without distracting the customer, the vendor said, adding all three modules can be placed where they can be used most efficiently.

The CRT can display full upper- and lower-case Ascii 128-character set in a 24-line, 80 char./line format. A total of 1,920 characters can be displayed.

The separate 119-key keyboard module contains 63 alphanumeric keys arranged in standard typewriter style, a 10-key numeric pad, 16 function keys to execute 32 standard commands and a cursor control located in a separate area as well as four transmission control keys.

Editing capabilities of the ADM-2 permit the operator to clear the screen, use a destructive cursor for character change and insert or delete characters or entire lines.

Total cursor control also allows the user to skip, backspace, forespace, move up and down, return, home and originate a new line, the company said.

Terminal Transactions

Holds Parts of Display

One of the operating modes permits the user to hold one part of the display in a protected field and maintain it at a low light level as standard forms are filled in as part of the transaction.

The operator enters the data from the forms in the unprotected field for display at normal light intensity. After the data is entered, only the data in the unprotected field is transmitted to the computer.

The form or data in the protected field is retained in the display memory and eliminates the need to send all of the data and saves transmission time, according to the company.

ADM-2 transmission rates are selectable by a panel switch and the CRT can operate at rates from 110 bit/sec to 9,600 bit/sec.

Half or Full Duplex

Half- or full-duplex transmission mode is also selectable. A "conversation" key or a computer-generated command can be used to select either the conversation or block transfer type of transmission.

A standard RS-232C interface port or a 20 mA current loop is provided for interfacing the ADM-2, and optional RS-232C interfaces are available for printers or multidrop series terminal applications.

The ADM-2 modular video display is priced "under $3,000" and delivery is within 90 days, the vendor said from 714 North Brookhurst St., 92803.

GE Termicheck Tests Units On-, Off-Line

MILLBURN, N.J. – The General Electric Co. (GE) has introduced a terminal tester called the Termicheck for testing GE Terminet terminals, teletypewriters, data sets, CRT displays and other RS-232 devices either on-line or off-line.

The tester can be used with voltage level devices, current level devices, data sets, frequency shift keyed devices and parallel interface units.

One of these five types of devices can be programmed onto the erasable programmable read-only memory (Eprom) of the unit at the basic cost of $1,400, a spokesman said. All five capabilities could be included in a single tester at extra cost.

Portable Unit

The portable unit weighs 8 lbs and can be operated with devices that have even parity, odd parity or no parity. It can operate at speeds between 110 bit/sec and 2,400 bit/sec.

Compatible with the Terminet 30, 300, 120 and 1200 as well as the Model 33 and 35 Teletype, the Termicheck can also operate with Bell 103 or 202 data sets or their independent equivalents, a spokesman said.

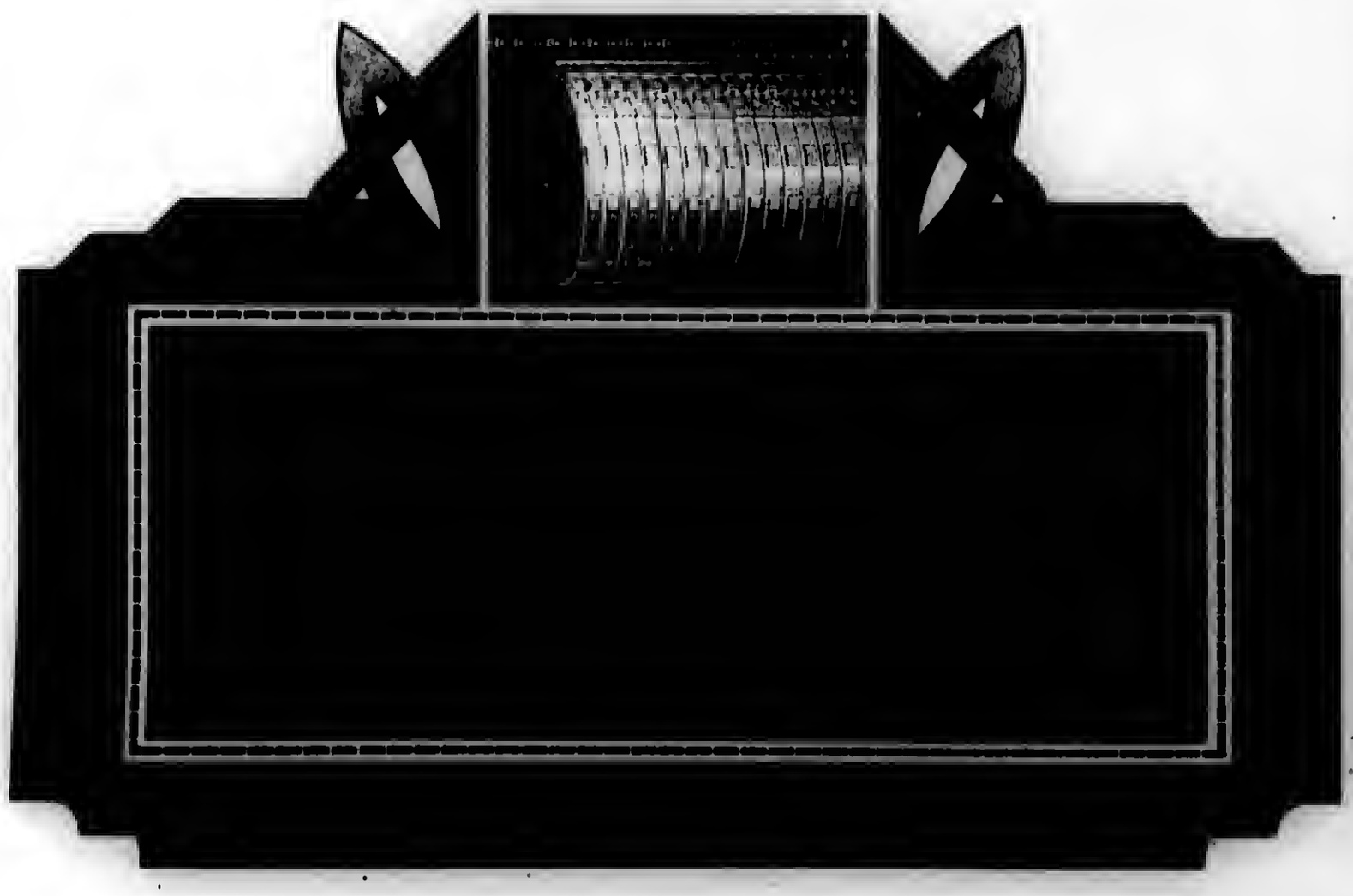
First deliveries are scheduled next month from 25 East Willow St., 07041.

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SYSTEMS&PERIPHERALS

Firm Gets 'Free' Branch Offices

Upgrade From IBM 370/125 to 360/50 Brings Bonus

By Patrick Ward
Of the CW Staff

CHICAGO – Steel Sales Corp. got a nice bonus when it decided to replace its hard-pressed IBM 370/125 with a 360/50 instead of a 370/135.

The firm is saving $4,500/mo in rental costs, more than enough to pay for the CRTs it wanted to install in five remote branches.

Steel Sales is a steel distributor here whose five branch offices extend into neighboring states. The firm's DP department runs an on-line order entry/inventory control/gross product reporting system and handles a wide range of batch work besides.

Back in 1968, the shop began running a 360/30, which Tom Bordner, its DP director, later expanded to 128K.

When IBM introduced the 370, Steel Sales placed an order for a 370/135. The shop had tuned the 30 "to the point where there was nothing left to do," Bordner explained.

"Our next project was putting remote sites on-line, and we didn't have any capacity to do that," he said.

After further evaluation, though, Steel Sales decided a 370/135 would be too expensive in terms of the performance it could offer. The DP staff began considering a 360/40.

IBM countered with a proposal for a 370/125, assuring Steel Sales the small 370 could do the job. Steel Sales decided to order one.

A 125 proved unavailable, so IBM brought in a 370/135 on an interim basis. "We went to the integrated file adapter, but basically we kept the same I/O set we had on the 30 on the 135," Bordner said.

Steel Sales wanted 3340 disk drives on its 128K 125, but did not want to go to VS. When the 125 came in late 1973, Steel Sales used an IBM-supplied package to emulate 2319s on the 3340s – the only way it could support 3340s on the 125 without going to VS, Bordner said.

Much as Bordner liked the 3340s for their reliability and storage capacity, the experience was "terrible," he said.

The emulator needed a buffer to decode addresses and, under heavy use in the Steel Sales shop, response times soared.

Responses that took 4 sec on the 30 took as long as 40 sec on the 125, Bordner said. IBM prescribed a conversion to VS so the shop could drop the 2319 emulator.

"We went on a crash program working night and day to get into VS," Bordner recalled. "I think it is a pretty easy transition now, but at that time our installation had a lot of things that were reasonably new. We had a lot of problems."

The switch to VS did relieve some of the response time problems by getting rid of the emulator, "but it also showed us the overhead, with the VS supervisors, was such that there was not much real core with which to work.

"We were running the equivalent of a 300K partition in about 30K of real core," Bordner said. "We were running background and foreground in virtual, and background was suffering drastically."

In addition, the shop's 1,100 line/min printer was occasionally generating only 200- to 300 line/min.

Steel Sales and IBM jointly decided the only answer was 64K more memory. "That did not work out too badly," Bordner said. "Eventually the system began running reasonably well."

Branches Not On-Line Yet

But Steel Sales still did not have its branch offices on-line. The company brought in a software monitor and found the current workload was already taking 60% of the 125's CPU cycles.

The test gave Bordner "little or no confidence" the 125 had enough capacity left to bring the branches on-line.

IBM proposed a 135 but, with a rental cost $4,000 to $6,000 greater than the 125 each month, it was out of Steel Sales' range, Bordner noted.

At this point, Bordner looked around for another alternative and decided in January to lease a 512K 360/50 from Greyhound Computer Corp.

The system costs about as much as the 125 did but offers far more capacity and performance, Bordner said. The 360/50 has eight Memorex 2319-equivalent disk spindles and runs under The Computer Software Co.'s Extended DOS operating system.

The approximately $4,500/mo Steel Sales saves by not renting the 135 covered the cost of putting on-line inquiry CRTs in the five remote branches.

An ITT 3127, equivalent to an IBM 2701, handles the remote ITT terminals IBM's Faster serves as the communications control software.

A 360 user these days requires a degree of independence in the way he approaches software, Bordner observed.

"Right now I'm looking at a 3270 light pen application," he said. While it's now possible on the 50, it used to be one of the many things that could not be done on a 360, he observed.

"The third-party people are no longer just brokers," he added. "In many cases they have now set up systems people to work with and help users. You're not particularly tied to IBM's apron strings anymore."

Four-Phase Adds 'Distributed Processing' Package

CUPERTINO, Calif. – Four-Phase Systems, Inc. has announced a "distributed processing" package that supports on-line entry, update and retrieval of data on its key-to-disk systems.

The package, called Data IV/70 Version 3, handles these functions and batch communications concurrently. Up to 16 keystations can interact with as many as 1,000 indexed sequential files, a spokesman said.

Version 3 will also boost the disk capacity of Four-Phase's IV/70 key-to-disk system from four 2.5M-byte units to four 66M-byte drives when deliveries of the 66M-byte drive begin in mid-1976, the spokesman added.

Version 3 has all the previous Data IV/70 features including table checks, multiple range checks, arithmetic relationships, batch balancing, cross footing, format chaining, field generation and conditional logic, the spokesman noted.

Order Entry Applications

In a typical order entry application, the key-to-disk system can be used in the branch offices of a large organization to maintain local customer and inventory files, Four-Phase said.

As customer numbers are keyed, the system automatically retrieves and inserts the bill-to and ship-to names and addresses, shipping method and credit terms. Similarly, as part numbers and quantities are keyed, the system inserts the item descriptions and unit prices, updates the on-hand inventory immediately and performs extensions.

If a part number is out of stock, the system can display alternate items for substitution. Through such techniques, Version 3 can reduce operator keystrokes by up to 90%, according to the vendor.

Data Retrieval Applications

In data retrieval applications, Version 3 enables all system operators to work simultaneously with the same current information. Records of up to 750 characters are retrieved by typing numeric, alpha or alphanumeric key fields.

In a sample file of 44,000 items, the corresponding descriptions are displayed in less than 1 sec, Four-Phase said. Any file may be accessed by all displays simultaneously.

Each display may also access multiple files simuttaneously, the vendor added.

In distributed-processing applications, Version 3 may be used to generate documents such as invoices, purchase orders and sales reports.

Users can establish formats with a parameter-oriented language. The Four-Phase key-to-disk systems also offer Cobol and RPG compilers for batch processing.

Version 3 supports IBM-compatible bisynchronous communications for transmission at rates up to 9,600 bit/sec. Either dial-up or leased lines may be used with 2780/3780 protocol.

Monthly rental for a system with eight displays, 2.5M bytes of disk storage and IBM 2780/3780-compatible communications is $1,133/mo on a 42-month lease.

A system with 16 displays, 66M bytes of disk storage and a 9-track magnetic tape drive rents for $2,626/mo on a 42-month lease.

Version 3 is available for immediate delivery with disk capacities from 2.5- to 10M bytes, Four-Phase said from 19333 Vallco Parkway, 95014.



Four-Phase Systems' Data IV/70 Version 3 allows concurrent data entry, retrieval, update and communications.

Mid-Range NCR Century Users Get Hardware, Software Options

DAYTON, Ohio – NCR Corp. has announced hardware enhancements and added software options for its Century 101, 151 and 201, the mid-range machines in the Century line.

The changes include expanded core memory and the ability to use multiprogramming and high-capacity disk units on the less-expensive machines in the Century series.

One of the enhancements for the Century 101 allows the system to use the NCR B3 multiprogramming operating system. The multiprogramming system was previously available only with Century 200 or larger systems.

Other changes to the Century 101 include expanded memory; formerly limited to 64K, the system can now be expanded to 96K or 128K of core memory.

In addition, NCR announced reduced rental rates for 48K and 64K memory sizes on the Century 101.

The changes also provide increased I/O speed which allows the Century 101 to use the NCR 657 high-density disk unit. This unit gives the system approximately 60% more storage on each pack than previously available, NCR said.

Disk Unit for 151, 201

The high-performance NCR 658 disk unit can now be used on the Century 151 and 201 systems. This disk unit has also been enhanced and there is now a model which provides either a 100M-character capability or, with an additional feature, 200M characters, NCR said.

The 658 formerly was available only on the larger Century 251 and 300 computers.

As with the Century 101, multiprogramming has also been added to the Century 151.

Additional hardware capabilities include a CRT console for the Century 101 and 151.

Another enhancement allows users of Century 101 systems with core memory to upgrade to a Century 151 with MOS memory at the user site. The hardware enhancements can be added in the field to previously installed systems.

Rental rates for a Century 101 system with multiprogramming begin at approximately $3,500/mo. Purchase prices start at about $130,000.

Monthly rental rates for a Century 151 multiprogramming system begin at the $4,000 level with purchase prices starting at approximately $150,000.

GCC Merges 360/30, Disk, I/O

PHOENIX – The Greyhound Phoenix Series/30 from Greyhound Computer Corp. (GCC) is a package combining an IBM 360/30 CPU, the Greyhound Phoenix disk subsystem and the Greyhound Phoenix I/O subsystem.

The Phoenix Series/30 is available for $2,500/mo plus maintenance on a 36-month operating lease.

Included in the price is support to convert the user from smaller systems such as the IBM System/3 and the 360/20 to the Greyhound Phoenix Series/30.

The basic configuration consists of a 64K CPU, decimal arithmetic, a selector channel, a 1052 adapter, a 1051/1052 printer console and an 87M-byte disk subsystem.

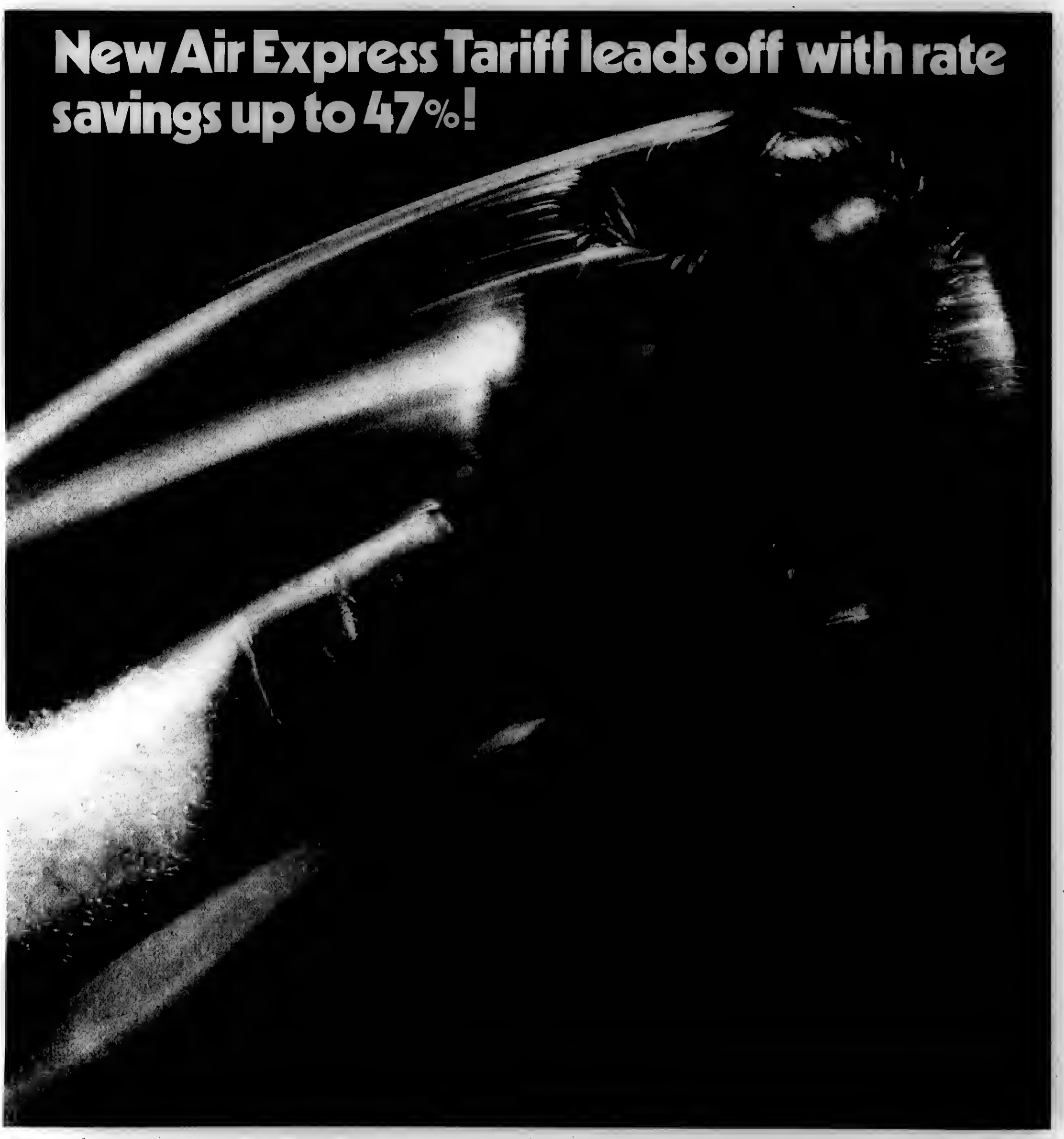
Also included are an I/O subsystem, a controller, a 600 line/min printer, a 600 card/min reader, a basic extended disk operating system and GCC's conversion service.

Optional features include up to 256K memory, six-partition support, a 370 instruction set and GCC's integrated communications adapter.

The Series 30 is available in all major U.S. cities. GCC is at Greyhound Tower, 85077.

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Detroit/Dallas										
REA Air Express	**5.00**	**6.50**	**8.50**	**11.90**	**14.40**	**22.74**	**28.05**	**35.10**	**66.40**	**93.60**
*Federal Express: Priority 1	10.86	14.25	20.22	22.98	26.21	32.56	—	—	—	—
Airborne	7.11	7.11	14.31	17.21	22.25	32.04	36.92	41.48	82.96	124.44
Atlanta/San Francisco										
REA Air Express	**5.00**	**6.50**	**8.50**	**15.50**	**18.00**	**31.63**	**40.76**	**51.30**	**100.00**	**145.80**
*Federal Express: Priority 1	10.96	15.32	20.51	24.92	29.24	38.03	—	—	—	—
Emery	7.07	7.47	16.96	21.40	26.91	41.12	54.07	67.01	124.28	186.42
Milwaukee/Miami										
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*Federal Express: Priority 1	11.74	15.86	23.94	28.10	32.47	41.26	—	—	—	—
Emery	7.07	7.47	16.96	20.92	25.16	35.78	45.25	54.63	98.32	147.48

Two

(Covers airport-to-airport service between major and other cities.)

WEIGHT FROM/TO	1	5	10	15	25	50	75	100	200	300
New York/Chattanooga										
REA Air Express	**7.00**	**9.00**	**15.00**	**16.26**	**20.50**	**29.62**	**39.19**	**41.20**	**68.00**	**102.00**
*Federal Express: Priority 1	11.69	15.29	23.53	26.70	30.41	37.71	—	—	—	—
Emery	11.00	11.00	17.42	21.16	24.45	32.73	39.62	46.42	84.46	126.69
Denver/El Paso										
REA Air Express	**7.00**	**9.00**	**15.00**	**15.57**	**19.38**	**26.80**	**32.33**	**36.00**	**64.00**	**96.00**
*Federal Express: Priority 1	11.64	14.67	23.65	26.85	30.29	36.81	—	—	—	—
Emery	11.00	11.00	17.42	20.89	23.48	30.14	35.18	40.15	71.80	107.70
Youngstown/Dallas										
REA Air Express	**7.00**	**9.00**	**15.50**	**18.34**	**23.84**	**33.98**	**42.15**	**53.40**	**91.40**	**137.10**
*Federal Express: Priority 1	10.86	14.25	20.22	22.98	26.21	32.56	—	—	—	—
Emery	10.94	10.94	17.35	21.74	26.10	37.20	47.24	57.16	105.86	158.79
Miami/Lexington, Ky.										
REA Air Express	**7.00**	**9.00**	**15.00**	**17.29**	**22.14**	**32.52**	**38.01**	**47.00**	**72.20**	**108.30**
*Federal Express: Priority 1	11.69	15.29	23.77	26.97	30.71	38.09	—	—	—	—
Emery	7.47	10.11	16.96	20.63	24.25	33.35	41.05	48.70	85.88	128.82

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State College Still Satisfied With RCA-Built Mainframe

By a CW Staff Writer

MILLERSVILLE, Pa. – Xerox computer users may get some encouragement from Millersville State College's DP department here, which is a satisfied Univac (RCA) 70/3 user four years after RCA's exit from the mainframe business.

The state college had previously done its batch jobs on an in-house RCA 70/35 and used Comshare's time-sharing service for interactive work, according to Thomas Houser, director of computer services.

But the college's five-year plan for computing services aimed at promoting "something like a free-access policy" to time-sharing, Houser said.

"When you're buying it, the more you use the more you pay," he observed.

The five-year plan recommended installation of a 262K 70/3 that would both provide an in-house time-sharing service and replace the batch-only 70/35.

Millersville chose the RCA-built machine because "there was a substantial discount on it" when Univac took over the RCA product line, Houser said.

Beyond that, "the cost could not be beat" for the kind of software that can be run on the 70/3, he said.

The vendor-provided software was good, he remarked, "but more importantly, we found a lot of universities had been using this machine prior to RCA's exit from the business" and "we ended up trading for different pieces of software with them."

The college has also developed a number of in-house statistical packages and programs and a group of student programming consultants, under the direction of Robert S. Sauders, the school's system administrator, have converted numerous other packages from Xerox, Digital Equipment Corp., Hewlett-Packard and IBM systems.

The college DP center's users can write programs in Basic, Fortran IV, Cobol, Watfor, Algol, Snobol, Lisp, Assembly, PL/I D and F, RPG and SFOR.

Altogether, there are over 1,200 academic application packages and programs listed in the DP center's program library.

The 70/3 runs under Release 10 of the VMOS operating system, but could easily convert to the VS/9 operating system Univac offers on its 90/60, Sauders said.

"This has given us a place to go without any change in software" should the college need a larger machine, Houser observed.

The 70/3 has a communications control module with 24 ports that serves about 20 on-campus and 10 off-campus terminals.

Most of these are either teletypewriters or Hazeltine CRTs, but there are also a substantial number of Digilog and Portacomm portable terminals, Houser said.

Millersville students run about 1,000 job/day during the school year, he said. "More than half of our 5,000-member student body has some interaction with the computer during its college years," he remarked.

The system also serves two local high schools equipped with teletypewriters.

With this time-sharing load, the Millersville staff feels it has to be careful not to let response times slip. To guard against this, the DP group wrote and installed a system activity profile (SAP) software monitor which runs continuously to track system performance.

"It gets such things as channel rate, swapping rate, paging rate and CPU utilization percentages from the different counters of the operating system," Houser explained.

The college verified the accuracy of its software monitor by attaching a Comress Dynaprobe to the 70/3 for a few months and measuring the same things, he said, adding the results turned out much the same.

Summagraphics Adds Dual-Tablet Digitizer

FAIRFIELD, Conn. – Summagraphics Corp. has announced a dual data tablet/digitizer system for digitizing graphics and entering alphanumeric, control and variable data, by utilizing a data tablet as a keyboard.

A 36 in. by 48 in. digitizer is used for supplying X-Y coordinate values for applications in cartography, interactive graphics, computer-aided-design, land analysis, architecture, space planning, medicine, etc.

The map, or plan, to be digitized is placed on the surface of the digitizer, and the data entered via either a stylus or cursor.

An 11 in. by 11 in. tablet, sharing the same controller as the larger tablet, is placed on the surface of the large tablet. This small mobile tablet can be oriented anywhere and used at will. With the same stylus, or cursor, the operator can move from the large tablet to the small tablet.

The Summagraphics dual system costs $5,200 from the frim at 35 Brentwood Ave., Box 781, 06430.

Frequency Changer Converts Foreign Power to Domestic

COVINA, Calif. – ALS Electronics Corp. has announced a solid-state, 50/60-Hz power frequency changer, the SMG-5-5.

The unit is designed to provide conversion from domestic to foreign or foreign to domestic power line standards for any application requiring a voltage and frequency stable power source such as tape and disk drives.

The SMG-5-5 operates at 92% nominal efficiency, a no-load idling loss of 2% of ratings and produces only a 62-db sound level, the vendor said.

The SMG-5-5 offers protection from overloads and short circuits, low output impedance and fast response, the vendor said. Any number of units may be paralleled to increase capacity or obtain redundancy and an uninterruptible power supply (UPS) option is available.

The SMG-5-5 costs $9,200 from the firm at 733 E. Edna Place, 91723.

THE NEW SYCOR 440



Three Trends Creating Need for Power-Line Monitors

By David Fuhrman
Special to Computerworld

Power-line disturbances have become real headaches for DPers in the last few years, with few installations entirely free of the problem.

Three continuing trends explain the increasing attention paid to power-line disturbances and their consequences.

First, on-line applications such as timesharing, data communications and industrial process controls have emerged as the fastest growing segments within the computer industry. The luxury of being able to reschedule processing runs on these systems simply does not exist.

Therefore, shutdowns and output errors caused by power glitches are completely unacceptable.

Secondly, as faster, more sophisticated solid-state circuitry is developed, CPU and peripheral equipment is becoming increasingly sensitive to high-speed transient impulses. Memories are particularly susceptible to spikes in the microsecond range.

Thus, manufacturers are requiring tighter and tighter specifications on the commercial power supplied to their machines.

The final important trend is the deterioration in quality of the commercial power in most regions. The expanding power distribution network leads to increased switching, the most common cause of high-frequency oscillatory disturbances.

Since the energy crisis, load-shedding and deliberate voltage reductions have become commonplace during periods of peak demand. These problems show no signs of letting up in the foreseeable future.

The combination of these three trends to more line-sensitive applications, more sensitive equipment design and deteriorating power quality results in the concern now being shown to powerline disturbances.

New-Generation Monitors

However, there is a new generation of power-monitoring equipment available to help designers and users cope with power-line disturbances. These are microprocessor-based instruments which interpret the raw power data and present it in a form suitable for immediate managerial action. The time at which each disturbance occurs is clearly indicated.

The monitors are small, portable and easy to install and operate. A major advantage these new monitors have over the older strip-chart types is their suitability for long-term unattended operation, since they only record when a disturbance exceeds preset limits.

The microprocessor-based power monitors are capable of recording and analyzing several types of power-line disturbances, any one of which, depending on its magnitude and duration, can cause a simple output error, a complete shutdown or even equipment damage.

Consequently, monitoring equipment is coming into wider use. For example, monitors make site surveys prior to installing DP or data communications equipment relatively simple.

The characteristics of power in each location are unique. By collecting statistical information on the number and magnitude of the various kinds of power glitches, a "power-line signature" can be composed. Very few installations require either no protection or a fully redundant uninterruptible power supply (UPS) system.

Typically, the most cost-effective solution lies somewhere between these two extremes. Regardless of the solution chosen, comprehensive power monitoring enables the user to anticipate problems of poor power quality before they induce costly equipment problems after installation.

Monitoring power on a permanent or a temporary basis in existing installations can also be highly effective in minimizing downtime. It enables the user to rapidly pinpoint the cause of output errors, shutdowns, lost information or damaged equipment.

Fuhrman is with Dranetz Engineering Laboratories, Inc.

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Shared file access.

The 440 system lets you share and access files locally, reducing investments in telephone communications and central CPU resources.

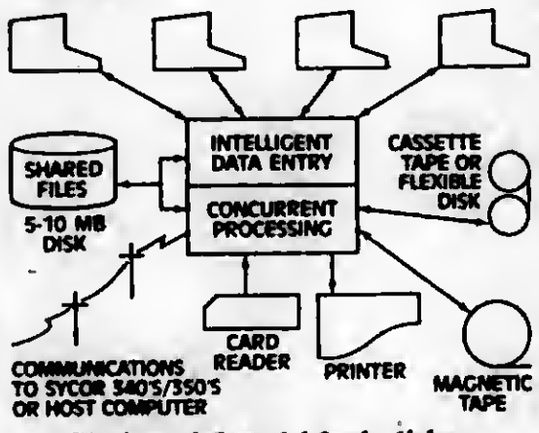
Data entry made easy. Now each operator, at her own display, can make use of current data in shared files to support data entry functions. For reduced keystrokes and lower error rates.

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There's full software compatibility with our Model 340 and 350 stand-alone terminals. Keyboards are also compatible.

Programming. One program fits three different systems—340, 350 and 440.

Communications. Communicate with the mainframe, emulating IBM 2770, 2780 or 3780 protocols. Or use the 440 as a polling station at your central computer site to receive and transmit data to remote 340s, 350s, and 440s.

Concurrent processing.

And best of all, while data entry is being performed in the foreground, you can be doing other jobs concurrently in the background. Jobs that can save you time and money. Jobs like:

Remote job entry. Use the 440 with its card reader and 300 LPM printer for large-scale remote job entry. And since the system contains a CRT and a keyboard, you don't pay extra for them.

Multi-terminal printer support. Each display can interleave print data to one printer as the data is being entered. So, you don't need a separate printer for each display.

Report generation. Sycor-provided programs let you produce all sorts of management reports—sales analysis, inventory, or billing—at the same time as you are performing data entry.

File maintenance. And the Sycor 440 allows you to do editing, sorting, updating, and file transfer in a background operation.

The lowest-priced distributed processing system.

When you consider all the advantages of our 440 system, and then consider its low monthly cost, we think you'll agree: it's the best system in the industry.

For more information on the new Sycor 440, or any of our other intelligent terminal systems, contact your Sycor representative, or write our corporate offices.

SYCOR

...applying intelligence to remote processing.

CORPORATE OFFICES: Ann Arbor, Michigan 48104 (313) 971-0900. DISTRICT SALES OFFICES: Atlanta (404) 455-3070 • Boston (617) 890-7290 • Chicago (312) 297-5200 • Cleveland (216) 741-4840 • Columbus (614) 888-8657 • Dallas (214) 521-6710 • Denver (303) 458-0794 • Detroit (313) 355-5770 • Greensboro, N.C. (919) 274-2964 • Hartford (203) 529-1100 • Houston (713) 785-2953 • Indianapolis (317) 788-1577 • Kansas City, Mo. (816) 842-7799 • Los Angeles (213) 640-0120 • Miami (305) 592-1533 • Milwaukee (414) 257-3780 • Minneapolis (612) 854-2309 • Newark (201) 773-7400 • New York (212) 371-9050 • Philadelphia (609) 665-1170 • Pittsburgh (412) 922-3350 • Portland, Ore. (503) 227-5672 • San Francisco (415) 349-6626 • St. Louis (314) 878-0090 • Washington (703) 527-0200. CANADA: Sycor International Ltd.: Ontario and Quebec.

Lundy Check Stripper Repairs Micr Checks Rejected by Machine

GLEN HEAD, N.Y. – Lundy Electronics & Systems, Inc. has introduced an automated check stripper, the Lundy 400, for repairing rejected Micr documents.

The Lundy 400 can process 8,500 check/hour with minimum operator attention, the firm said.

The unit has the same automatic feeder and stripping mechanism used on the higher priced Lundy MAE and has automatic detection of severely mutilated items which can jam reader/sorters.

Rejected Documents Loaded

In operation, rejected documents are loaded into the input hopper and the high-speed feeder moves each check to the stripping station, where the 5/8-in. Lundy strip is attached to the bottom of each document. The check is then lightly embossed with a patented process, ensuring even stacking of stripped documents when reentered on a high-speed reader/sorter.

The stripped documents are then delivered to a single output pocket. The Lundy strip can now be reencoded on any Micr encoder. The rehabilitated check is now ready to be processed as a high-speed item.

The Zip Code for Glen Head is 11545.

Stoddard Diskette Hardhole Eliminates Wear Problems

WESTLAKE, Calif. – The Diskette Hardhole is a product designed to eliminate the hole-wear problems of floppy disk media, according to its vendor, Stoddard Engineering.

The product also improves registration and minimizes particle contamination, the vendor said, adding it can be easily installed by operators.

Stoddard offers two $9.95 packages. One includes 20 Diskette Hardholes and a attachment tool. The other contains 50 Hardholes.

Delivery is immediate from the firm at 32131 Lindero Canyon, Suite 212, 91361.

Besides Order Processing

Firm's 'COP' Patrols Product Shortages, Sales Control

By V.H. Goodwin Jr.
Special to Computerworld

A centralized order-processing (COP) system at Exxon Chemical Co. U.S.A. has provided the expected benefits in improved customer service and more efficient operations but has also coped with recent product shortages and sales control procedures quickly, precisely and effectively.

Today our 25 sales service coordinators handle a variety of customer-related tasks on a real-time basis. For example, a coordinator can quickly determine a customer's up-to-the-minute situation with respect to open orders, shipped orders and sales controls.

This is all made possible by a real-time data base. COP operates on an IBM 370/165 and uses a 155 for backup. Data base updates and inquiries are managed by IBM's Information Management System (IMS) and initiated through 2260 CRT terminals, soon to be replaced with 3270s.

Our sales service sections are organized along product lines. Each coordinator is assigned to specific customers and has prompt access to order status and product inventories as well as the current sales control status, if any, for products and customers.

This information is especially useful when a customer urgently needs a product at a designated location. The coordinator is better able to provide accurate information on product availability and commit to a shipping date. Ordered quantities are charged against available inventories during the order entry process.

The on-line inventory system also provides timely information on available inventory, committed inventory and in-transit replenishment stocks. In addition, optimum supply point, package type and mode of shipment information are displayed on the system's terminals.

Customers are thus assured that ordered quantities are committed as soon as an order is entered into the system. The order is promptly printed on a hard-copy terminal at the supply point that will ship it. The computer also produces order acknowledgments that are mailed daily.

Transportation services for moving the products are provided by a centralized traffic group which arranges for carriers to meet the scheduled shipping dates.

This centralized processing capability helps speed orders on their way at a time when fast response is especially important. Of the more than 300 orders the company handles daily, about 25% must be shipped the same day, and another 30% must be shipped the following day.

Provides More Lead Time

COP – by expediting orders to a plant, warehouse or shipping terminal – improves our customer service capabilities by providing more lead time at supply points for planning and scheduling.

COP serves seven of the eight product line organizations of Exxon Chemical Co. U.S.A.

Historically, our order processing, transportation and other distribution-related functions for those product lines were highly decentralized. In 1967, a new distribution organization was established by Exxon and assigned corporate responsibilities for these activities – at a time when distribution costs were first recognized by many companies as their third largest cost.

Order processing initially remained decentralized and was handled by 19 local sales offices, but the organizational restructuring allowed plans to be drawn for eventual consolidation.

Order/Invoicing System

In 1967, a major project was also under way in Exxon's Mathematics, Computers and Systems Division. It was developing a computerized real-time order/invoicing system. This system was eventually designed to implement, in steps, on-line order entry, order printout, ship data input, inventory management and other critical tasks.

The batch invoicing program was initiated in 1969, on-line order entry in 1971 and inventory management in 1973. Invoicing – as well as the generation of order activity, inventory and control reports – is performed nightly.

Enhancements planned for the near future include computer-generated bills of lading, a freight rate data bank and an on-line rail car inquiry capability.

Justification for our on-line system results primarily from manpower savings and improved cash flow due to faster and more accurate invoicing.

Daily summary reports provide sales service coordinators, marketing and management as well as our customers with timely and accurate information on the status of all order activities. Previously, such information was available only by laborious manual effort, but never as timely or complete as required.

In 1972, it became increasingly apparent that the on-line system provided us with ample resources to further optimize our order-processing organization and procedures. We had a network of 18 sales offices which serviced local customers and forwarded all orders to a central order center in Houston.

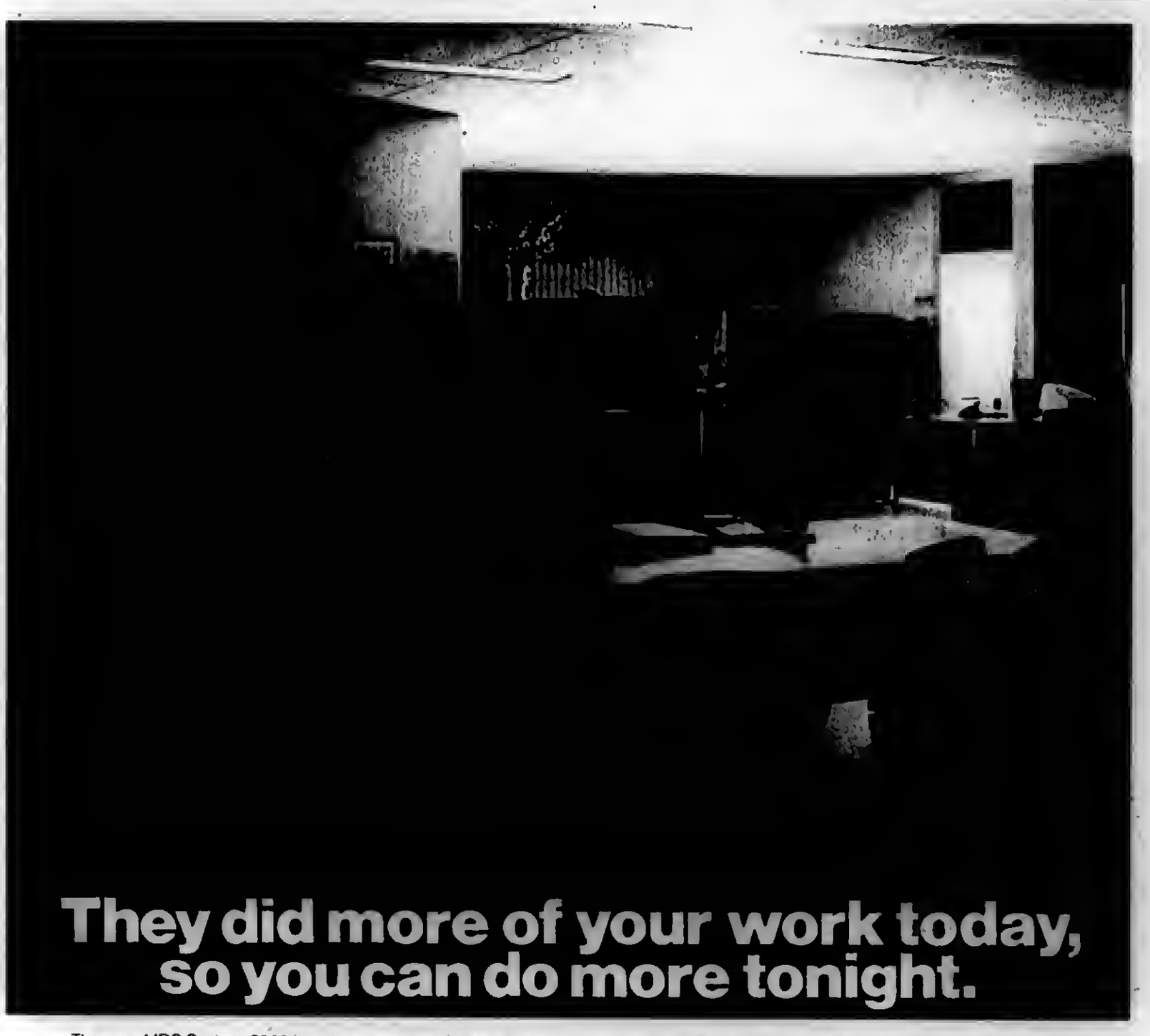
In early 1973, a 60-day pilot program was initiated in which northeastern customers placed their orders direclty, through a toll-free number, with our Houston center.

Some coordinators in northeastern offices were temporarily moved to Houston and continued handling their accounts through the new system.

By mid-year, the pilot program was judged successful, and management approved the move to COP. We implemented it over six months.

COP successfully met many challenges during 1974, including product shortages, transportation equipment shortages, truck strikes and weather problems. It proved to be adaptable, efficient and extremely reliable in a rapidly changing environment.

Goodwin is distribution operations manager with Exxon.



The new MDS System 2300 lets the people who create your workload handle some of the load.

System 2300 is an intelligent programmable terminal which gives you the efficiency of document preparation and *simultaneous data entry*, where the data originates.

Your programmed instructions are displayed in plain English on the 2300 CRT and guide the operator through forms preparation. The result is properly prepared data waiting for automatic transmission to your central processor. Data and forms are prepared in a *single, error-free operation* on System 2300 by your existing clerical personnel.

At night the 2300, in unattended mode, sends selected disk stored data to your Network Controller or CPU. And processed results are delivered to your terminals overnight. System 2300 can satisfy your local, central and network objectives. It can do it faster, more accurately and with greater flexibility than any previously available system. With intelligent data entry and document preparation handled remotely during the day, you reduce the processing load on your computer center.

Currently installed 2300's are demonstrating remarkable productivity gains in applications such as invoicing, purchasing, order entry, inventory control and management reporting.*

System 2300 comes from the Data Entry specialists, and is backed by one of the finest support teams in the industry. With System 2300 you can consolidate your data management resources, increase operating efficiency, reduce central computer usage, and make a significant contribution to your bottom line. By stretching your 8-hour day into 24 hours of productivity.



Ask your local MDS representative to show you how System 2300 can reduce your workload so you can do more work. Call (201) 540-9080 or write Mohawk Data Sciences Corporation, 1599 Littleton Road, Parsippany, NJ 07054. We'll get back to you overnight.

*Documentation available on request

MDS.
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Mini Bits

Pushpa Core Gives 64K With 240 Nsec Access Time

WESTMINSTER, Calif. – Pushpa Memories has entered the minicomputer add-on memory market with 64K-byte add-on card memories for Interdata's 74, 7/16, 7/32 and 8/32, Data General's Nova series and Digital Computer Control's D-116 series of minicomputers.

Pushpa said these core memory units have a 240 nsec access time and 650 nsec cycle time. However, the firm noted, the memory interface has been designed to automatically match and adjust its timing specifications to that of the computer.

Pushpa said it plans to sell its memory cards for approximately the same price charged for its 32K-byte memory.

The firm is at 14142 Ipswich St., 92683.

MDS/11 Develops PDP-11 Software

HARTFORD, Wis. – The Micro Data System (MDS/11) from General Robotics Corp. (GRC) uses a Digital Equipment Corp. PDP-11/03 CPU which gives the unit the capability to develop software packages for other PDP-11 systems, the firm said.

In addition to the central processor, a single-drive, IBM-compatible floppy disk unit is included in the basic MDS/11 configuration. The controller can be expanded to accommodate up to four drives for a total of over 1M bytes of on-line storage.

Also included in the package is a 24-line, 80-column, 9,600 bit/sec CRT terminal.

A basic system includes an 8K-word CPU, single DMA-controlled IBM-compatible floppy disk and GRC's own FDRT-11 operating system.

This configuration is priced at $8,265, GRC said from 57 N. Main St., 53027.

1,024K Prom Fits PDP-11

TROY, Mich. – System Associates has 1,024K-word programmable read-only memory (Prom) for the Digital Equipment Corp. PDP-11.

The Prom is contained on one quad-size PDP-11 module. The memory can be located at the appropriate Unibus address by jumpers on the module. Proms are available from 256K to 1,024K words.

Each memory chip (Intel 1702A or equivalent) is programmed off-line on a separate device. The user can reprogram the unit as desired.

The 1,024K-word Prom is priced at $750 with delivery in 60 days. Prom programming of user-supplied programs is available upon demand.

System Associates is at 55 Park St., 48084.

Diva Cuts Disk Prices

EATONTOWN, N.J. – Diva, Inc. has reduced prices up to $1,300 on its line of large-capacity and floppy disk systems.

The DD-25, a 127.4M-byte capacity, dual-spindle drive which includes a DOS I/O driver on paper tape or 800 bit/in., 9-track magnetic tape, is now priced at $28,500.

The DD-23, a 63.7M-byte, single-spindle drive, has been reduced to $17,990.

The DD-14/2, a 63.7M-byte, dual-spindle drive, is priced at $22,900 and the DD-14, a 31.8M-byte, single-spindle drive, is now $12,600.

Diva's DF-100 floppy disk controller is now being offered at $2,095.

The floppy disk systems, DF-101, DF-102, DF-103 and DF-104, have been reduced to $2,995, $3,750, $5,300 and $6,995 respectively.

Turnkeys Also Touted

Minis Tolling Death Knell for Big CPUs?

By Patrick Ward
Of the CW Staff

BOSTON – Does distributed processing spell the end for large central mainframes and the people who run them?

Can minicomputers really take over the small businessman's clerical burdens with the turn of a key?

Two panelists at a session on minicomputers at a recent Data Processing Management Association regional conference here tended to answer these questions affirmatively, but their audience was laced with skeptics.

One of the panelists said he first realized the capabilities of minicomputers when he worked for a company with a central CPU and five remote branches.

"The central mainframe wasn't up to handling the job, so the company moved minis to the branches. Before long, there was hardly anything left for the large machine to do," according to Martin F. McDonough, now president of Value Data Processing.

"Instead of having a large 370 running in four or five partitions, one way of the future might be to distribute that power to the user departments," added Ardyn E. Dubnow, DP chief at Northrop Corp.'s Electronics Division.

The user departments "could do 90% of the editing there and then batch the data to the host" or, alternatively, do 100% of the editing there and keep their data on-site, he said.

Physical, Functional Types

There are both physical and functional types of distributed processing, Dubnow explained. Physically distributed computers could mean the arrangement of five or six minicomputers in a ring formation.

Each mini would have its own data base, but could communicate with the other minis, he said.

User departments would keep their files on prime interest on one particular machine. Each department could retrieve data from others' machines to do their own processing, but could not change the data on another user department's prime files.

In the functional variety of distributed processing, an intelligent terminal or minicomputer would maintain its own unique files, while a host CPU would keep a data base of common files.

Key entry and editing would go on at the distributed sites and serve to update the central data base, Dubnow explained.

But members of the audience had some points to make, too.

"If you're talking about a worthwhile ring formation, you have to put a lot of controls on it to manage it all," one attendee said.

Therefore "your costs begin to come up to those of a typical host computer," he said.

"Local-level distributed processing is primarily a data entry function, but your host costs may go up if you have to add further controls and hierarchical software," another attendee pointed out.

"There can be a trade-off in costs," he added.

Distributed processing can also mean "compensating for varying levels of competence in different departments," a third attendee said.

While he said he can understand how departmental managers might want their own computing operation, "four managers means four stand-alone systems run with varying levels of checks, balances and other quality controls," he said.

"If you want your organization to be a football team, do you want to have four quarterbacks?" the attendee asked.

While "breaking off elements from a hard-pressed central DP site is the wave of the future, someone has to have unified control over the organization," he stressed.

The question of whether the DP group should be an independent authority responsible for all the data that passes through a company or whether DP should be just an appendage of the finance department was at issue here.

Both of the latter attendees felt a DP group should have an overall responsibility for the DP-generated data their corporations use.

First-Time Users

How easily can minicomputers fit into the operations of first-time user? This question came up as McDonough described how his company has turnkey systems installed and doing productive work in six weeks to 90 days.

There are typically two to five CRTs brought in for on-line entry, no card equipment and maybe two or three matrix printers, McDonough said.

The turnkey systems use mostly prewritten software that covers, among other applications, on-line order entry and accounts receivable processing – "the complete business package," he said.

"But I don't believe it's possible to train people in that time," a questioner said from the floor. "Doesn't ordering forms from the printer take at least that long?"

"How long does it take to install a copier or adding machine?" McDonough parried. These minicomputer business systems provide the same kind of utility function, he said.

People shouldn't interpret turnkey minicomputers as "a simplistic answer," one attendee commented. Company A may have different procedures than company B because it's in a different industry, he said.

While he agreed precoded software packages have been successful in some cases, the user questioned whether they were the answer for most shops.

But "payables are payables are payables," Dubnow concluded.

Bendix Picks Two Minis To Collect, Relay Test Data

KANSAS CITY, Mo. – The Kansas City Division of the Bendix Corp. here uses two minicomputers for the collection, editing and analysis of data generated during production of hybrid microcircuit assemblies.

One of the minis – functioning as a satellite minicomputer in a manufacturing area – receives and checks data from product-testing stations, reformats the information, updates short-term quality history files and passes the test results to the second unit.

The second machine, a remote front-end processor, uses Hasp/RJE-type software to transmit accumulated data through a Hasp link to an IBM 360/65.

Bendix uses these Varian V73 computers now to collect test data from three types of hybrid devices. The minicomputer network eventually will be expanded – through the addition of satellite systems – to serve other manufacturing operations within the Bendix plant, according to Michael Rimmer, a senior control systems analyst with the division.

Direct to Satellite

In Bendix's setup, data from computerized test stations move directly to the satellite from the testing equipment. Results from manual tests are entered by operators through CRT terminals.

When it receives the data from a manual station, the satellite V73 determines whether the information was entered properly and whether the data values fall within acceptable limits for the parameter measured.

If so, it accepts the data; if not, it queries the operator for correction or confirmation. Out-of-limits data are accepted only when the operator confirms them.

The V73 then reformats the data and uses the reformatted information to build short-term history files that show test results for the 50 devices most recently tested.

These files are especially valuable to the division's quality-control engineers during the startup or modification of a manufacturing process.

Guide to Tests

The satellite V73 also retains a guide

(Continued on Page 32)

EDS Gives Nova Four-Port Board

IRVINE, Calif. – A lower price model of the EDS-8 data channel multiplexer has been introduced by Educational Data Systems (EDS).

The new four-port data channel multiplexer board, the Model 300-A4, plugs into one slot of any Data General Nova-type computer.

This board handles four serial asynchronous devices operating independently at RS-232C levels in half- or full-duplex mode. Data rates are program-selectable up to 9,600 bit/sec.

All I/O control functions are performed in hardware, but data rate and character size are under program control for each port, the firm said.

The Model 300-A4 features automatic buffer mode for input or output of entire character strings without program interruption. The size and location in core of each I/O buffer is under program control.

The automatic buffer mode uses the data channel to minimize computer overhead and allows recognition of special characters requiring interrupt. Automatic echo with no additional computer overhead is under program control, EDS noted.

Device control and status lines allow control of peripheral equipment locally as well as through modems for remote peripherals. For a full-duplex Bell 103-type data set, the device control line is used as the data terminal ready signal and the status line is used for the carrier detector signal.

The Model 300-A4 operates in either current loop or RS-232C mode.

Device connection to the Model 300-A4 is direct to the board and requires no modification to computer wiring.

The Model 300-A4 is priced at $1,600 from EDS at 17981 Sky Park Circle, 92707.

Shouldn't Be 'Faceless Mass'

Managers of Small DP Shops Must Demand Recognition

By Toni Wiseman
Of the CW Staff

BOSTON – Having an IBM System/3 is not a disease, although larger users' reactions might lead one to believe it is akin to leprosy, attendees at a recent regional Data Processing Management Association (DPMA) conference here were told.

It is time small- and medium-scale users stopped being the faceless mass, Al DelGardo, DP manager at Ward-Johnson, Inc. told attendees.

"You are responsible for being a small, nonvocal minority, but in reality you are a majority," Delgardo said, adding the reason small users have not been better represented at association conferences and other professional meetings is they have never demanded recognition.

DP Managers' Problems

Small- and medium-scale DP managers face the same problems as large-scale managers and then some, because they are more visible, interacting with senior management probably daily, he said. In a larger organization there is a longer chain of command.

"In the area of small- and medium-scale computer installations, DP managers tend to view their career and job opportunities in very negative terms," DelGardo said. "Firing and job changes are common."

"This is pretty much due to indifference to developing management skills in this area," he said.

Senior management's tendency to treat the DP manager in this area as a scapegoat when anything goes wrong is also common, due to the vendor's habit of overselling the hardware's capability and underselling the people, he said.

All too often, senior management judges the DP manager on the amount of paper which comes out of his area, he said. Management must be educated so it knows what the computer resources are.

Decision Already Made

In many companies, the decision to purchase the small- or medium-scale computer was made before the DP manager was hired, DelGardo said. By the time the manager comes in, the vendor has already sold senior management on which systems should and can go up.

The DP manager starts the design of those systems, but, meanwhile, the resource is just sitting there so he has to put up some programs for quick payback, he said.

What this all boils down to is that when it is time to put the "major" system up, the DP manager finds he has run out of disk and needs an additional programmer or other resources.

This is when management says the vendor estimated the shop should run on $200,000/year, not $400,000/year, and that DP manager gets fired, DelGardo said.

Then a new manager comes in, cuts a programmer or some equipment to save money, and pretty soon he's in serious trouble operating the shop and gets fired, he continued.

"A consultant is sometimes called in at the last minute to share the blame," DelGardo said. "And he charges the company thousands of dollars to tell senior management the same thing you've been telling them all along."

"You can show management what areas are being effectively served and which are not, but the question to be answered is why the DP department was formed. Was it for more efficient operations or for new operations?" Senior management has to answer this question," DelGardo said.

The DP manager must be an agent of change, DelGardo said; he has to develop managerial skills and learn to play the games of politics and management.

"Business is a game; management is a game. There are rules; know when to bluff, when to call a bluff and when to pull in your horns," he advised.

Finally, DelGardo stressed the necessity for managers to insist they be treated as management, as an executive and not as a technician.

Two Minis Collect, Relay Data From Product-Testing Stations

(Continued from Page 31)

that describes the tests to be performed at each manual station and the data the test operator must enter through his CRT terminal. Any operator can consult the guide by requesting a CRT display of its text.

Developed as Manual

The guide was developed initially as a printed manual, and the operators then recorded their data on printed forms. By converting the guide and the data forms to computer records, Bendix engineers eliminated not only paperwork, but also the paper itself.

After reformatting the test data and updating its history files, the satellite V73 passes all of the data to the second V73 – the front-end processor.

This machine uses Varian's Hasp/RJE software to emulate an IBM 360/20 remote job entry unit.

The front-end processor accumulates information from the satellite and, at intervals of 15 to 30 minutes, incorporates it into a jobstream that moves through a Hasp link to the 360/65.

This information includes test data from automated testing stations; test data from manual stations; updates to the inspection guide master file; record-of-assembly information, which includes the serial number of each finished assembly and the serial numbers of the individual components; and quality-attribute information – the number of units sampled out of each lot, for example, and the failure rate among devices sampled.

Exception Report

When it receives the test results transmitted by the front-end processor, the IBM 360/65 checks them and incorporates out-of-limit values into a daily exceptions report for Bendix's production engineers.

All of the test results are placed into an on-line data base which can be consulted through remote terminals.

ATHANA

If you think costly disk product failures are a necessary evil in today's inflationary economy you need to know more about disk product media

INFLATION FIGHTERS

Hello, IBM.

ADDS introduces the first truly low cost CRT terminal for the IBM user.

We've been waiting a long time to say this:

Hello, IBM!

There, we finally said it.

You see, IBM (we almost feel like we should call you "sir") Applied Digital Data Systems (that's us) now has a terminal for IBM users. Wait'll you see it.

It's called the 980A. And, it's packed with the features that helped ADDS carve a reputation in the Teletype® compatible market. Sharp, readable screen with upper and lower case character display. Line as well as character insert/delete. Not to mention blinking, formatting, and patented graphics.

Compatibility?

The 980A looks just like a 3270 to the telecommunications access method (BTAM, TCAM, etc.) and to such real time monitors as CICS. It can even operate on the same phone line as 3270's.

However, since your 3270's don't have blinking, lower case, graphics (or most other special 980A features, we might add), applications software developed to support the 3270 won't support our 980A. So we don't think we'll be replacing many of your 3270's.

But, the IBM user can develop new applications around the 980A. And the reason we think he should (here's where you get nervous again) is quite simple. The 980A offers unmatched features at an extremely low cost. Namely, $3200.00 to purchase, $90.00* a month to lease.

And all of our units are serviced by NCR.

That's pretty much why we think if our shoe fits, the IBM user's going to wear it.

Because even though you're very, very good, IBM, there's always room for a little improvement.

Sir.

Hello, ADDS.

I may have a new application for your 980A. Please send additional information.

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Versatec Output System Prints Hard Copy From Minis and CRTs

SANTA CLARA, Calif. – A hard-copy output system from Versatec produces printout and graphics on-line from a computer and, on command, hard copy direct from a CRT.

A complete output package, the system includes any of four standard Versatec printer/plotters, associated controllers for specific computers and CRTs and Versaplot plotting software, the firm said.

Through triplexing, one printer/plotter serves three output functions by replacing line printer, pen plotter and dedicated CRT hard-copy device. The system will print up to 1,000 132-column line/min, plot graphics on-line at up to 2.4 in./sec and, on command, produce permanent hard copy from up to four CRT displays, the firm said.

The system prints and plots simultaneously under machine control without changing hardware. When hard copy is requested from a CRT, the system prints the desired copies, then returns to computer-directed work. Various priority protocols allow the user to preselect the switching configuration. At user option, the switch from computer work to CRT can take place at the end of line, page or transmission, the firm said.

When switched to the CRT copy function, copy is printed within 10- to 20 sec. After the copy is printed, the system automatically returns to computer-directed work, the firm explained.

Electrostatic Writing

Dual array electrostatic writing produces high contrast graphics with enhanced detail, Versatec said. Resolution of up to 200 dot/in. is available, the mean time between failure is rated in excess of 3,000 hours and operation is virtually silent, the vendor added.

Four printer/plotter models offer a range of 500 to 1,000 line/min print speed (asynchronous); .45 to 2.4 in./sec plot speed (asynchronous); 11- or 20 in. paper width; a 64 to 128 Ascii character set; and 132 to 180 columns.

Options include simultaneous printing and plotting, dual buffers and larger character sets.

Controllers are available for 30 popular minicomputer and computer models, Tektronix display terminals and other CRT units.

Versatec CRT controllers range in price from $950 to $1,750. Total output system packages (printer/plotter, computer and CRT controllers and plotting software) are priced from $9,925.

The firm is at 2805 Bowers Avenue, 95051.

Decus Sets Fall Meeting

MAYNARD, Mass. – A discussion of federal legislation protecting privacy and its impact on computer users will be a special feature of the fall meeting of the Digital Equipment Computer Users Society (Decus).

The meeting will take place in the Los Angeles Hilton Hotel Dec. 2-5.

The keynote speaker will be Keith Uncapher, director of the University of Southern California Information Sciences Institute at Marina Del Rey, who will speak on "Computers, Computing and Communication – 1980 Style."

The user group can be reached through DEC, here at 01754.

NCR

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System Studies Speech Problems For More Efficient Correction

By Ann Dooley
Of the CW Staff

ITHACA, N.Y. – Correcting children's speech problems has always been slow and frustrating, but now, with the help of computer speech analysis, the process may be made quicker and more efficient.

Kal Telage of the Ithaca College Department of Speech Pathology and Audiology has designed a method of analyzing the key features common to an individual's speech errors. "Simply because speech happens so quickly, you can't observe the process; you can only perceive the problem," Telage said.

"The computers can hold information that would be impossible for the individual to remember," Telage said. "Some sounds involve a half dozen or more features, and the computer can put these bits and pieces together and identify a pattern which may relate to many sounds a child cannot correctly say."

Speech pathologists are able to describe individual sounds by their physiological features or the movements which make up each sound. Since each sound includes a variety of features, the computer is used to identify the problem features by ordering and identifying them.

The child is tested to identify individual trouble sounds which become the target for further testing. Then the computer is used to analyze the information in terms of two types of problems: features that are missing and features that are being used inappropriately.

From this, certain features are identified and how they are contributing to individual sound error is studied. A few key features of speech may be causing the child to misarticulate many sounds.

In the past, speech pathologists have worked on such sounds individually, but with the computer a number of sounds can be improved by concentrating on the key features involved.

"With this information, we have knowledge of what the child is failing to do or is doing incorrectly, and this will let us develop a more individualized program," Telage said.

File Lists Lovelorn Zoo Animals

ST. PAUL, Minn. – A zoo in Kansas City, Mo., needed a mate for its marmoset but couldn't find one; a zoo in Washington, D.C., had an extra one but didn't know Kansas City wanted one.

The two Brazilian monkeys might have gone unmatched had they not been listed in a computerized file of zoo animals kept by the Minnesota Zoological Garden here.

The nose count lists about 50,000 mammals, representing 850 species living in North American zoos, and is a product of the International Species Inventory System (Isis), sponsored by the American Association of Zoological Parks and Aquariums.

In addition to allowing relatively easy matching, the list enables animal conservationists to determine how many animals classified as endangered species – such as the gray wolf, Siberian tiger and Indian rhinocerous – are in captivity.

Officials in participating zoos fill out one form per animal, listing its scientific name; common name; date of birth; parents; and, in case of death, its cause.

The data is processed on the state's IBM System 370/158 in St. Paul.

"The system enables us to generate a 'profile' of each animal, to pinpoint unwanted genetic defects and to prevent an animal with a defect from mating and transmitting it to the next generation," a zoo official said.

Zoo officials predict Isis will help them learn how long certain breeds will live in captivity.

Changes in DP Field To Radically Alter Conduct of Banking

NEW YORK – Within the next five years the conduct of international banking will be radically altered as a result of changes in computerized information technology, a meeting of bankers was told here recently.

Also, banks in virtually any country will be able to instantly analyze worldwide financial and economic developments through international on-line computer networks, according to John D. LaMothe, manager of product development for Interactive Data Corp.

While banks in the U.S. have been highly sophisticated users of computers, the technology and economics for international information networks have just recently begun to emerge, he said.

Major factors which will make worldwide data communications networks possible are lower cost computers, satellites and simplified computer applications languages, LaMothe said.

DP Determines Best Time For Use of Insecticides

MOSCOW, Idaho – Not Raid but computers are out to control the population of harmful insects, according to researchers at the University of Idaho College of Agriculture and the U.S. Department of Agriculture.

Insecticides must be applied at exactly the right time for maximum effectiveness, according to Donald E. Scott and George Butler, entomology researchers.

Typical insecticide treatment kills 98% of the larva and only about 65% of the adults so it was important to discover when their larval stage occurs.

Using a complex thermodynamic model, the researchers found higher temperatures promote growth at the larva stage.

Computers were then used to predict the summertime growth of corn earworm numbers in conjunction with the variation in temperature to determine the best time to apply the insecticides.

The entomologists conducted research into the carworm growth and found the insect larva population peaks in August after eggs hatch in July.

NCC '76 Student Fair Soliciting Projects

MONTVALE, N.J. – The 1976 NCC Student Computer Fair will be held during the 1976 National Computer Conference which will take place on June 7-10 in New York City.

Elementary, middle and high school students are eligible to enter projects in the fair. The deadline for submittal of application forms is April 1.

"We want students to concentrate on the social situations they know best. We'd like students to create new computer tools for home or school use, produce a work of computer art or design and implement a computer game," according to Dr. Sema Marks, director of academic computing at the City University of New York and chairman of the fair.

Marks can be reached at City University of New York, 33 West 42nd St., New York, N.Y. 10036.

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1. Unmask some of the misconceptions and myths that surround sorting.
2. Measure the exact amount of CPU Time, I/O Activity, and Elapsed Time that every sort on the market consumes.

First, we gathered the leading competitors from the Wide World of Sorts—our own SyncSort III-and-a-half, IBM's PEER/ICEMAN (SMI-5740), their older sort (SMI-5734), and a fourth contender from a minor sorting power.

Next, we asked three computer installations in the East, Midwest and West to provide the "tracks." They were to choose the files to be run and make the evaluation of the results. No hanky-panky. At one center, all four sorts were put through their paces under exactly the same conditions. At the other two places, SyncSort was matched against the IBM sorts.

Finally, we did something that's never been done before on the playing fields of sorting. We brought in a hardware monitor to judge the events.

SMF analysis wasn't good enough. It doesn't tell you what's really happening in a sort and it helps spawn those myths we referred to above.

By the time the dust settled, Whitlow's anthem had been played three times and SyncSort III-and-a-half had walked off with Gold Medals for:

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- Least Elapsed Time. SyncSort used 33% less than the average.

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Or ask him if it's true that you can reduce channel time or device busy time by reducing EXCP's. He may not be aware that that's one of those sorting myths.

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COMPUTER INDUSTRY

CI Notes

Memorex, Others Ordered To Pay $4 Million in Suit

SANTA CLARA, Calif. – Plaintiffs in the suit against Memorex Corp. and a number of other defendants which alleged violations of federal securities laws and regulations in 1970 and 1971 will receive an aggregate payment of $4 million.

Under the ruling made in the U.S. District Court for the Northern District of California, Memorex will pay $1 million in cash and notes toward this amount.

While neither Memorex nor any of the other defendants admitted any liability in connection with the suits or their settlement, the company said it wants to dispose of the burdensome litigation.

ICL Buying Into NCR/CDC Firm

DAYTON, Ohio – NCR Corp. and Control Data Corp. have signed an agreement with International Computers Ltd. (ICL), Britain's major computer manufacturer, which allows the Britons to eventually acquire one-third of the shares in Computer Peripherals, Inc. (CPI).

ICL initially will purchase a one-sixth interest in CPI for about $8.6 million.

CPI presently supplies both CDC and NCR with all their card, tape and printer equipment.

Marshall Gets $800,000 in IBM Suit

LOS ANGELES – Marshall Industries has been awarded $800,000 as part of the settlement of an antitrust suit filed against IBM in December 1973.

The El Monte, Calif., distributor of electronic components filed suit in the U.S. District Court, Central District of California, here.

Under terms of the settlement, IBM will pay the cash settlement and both must drop all other claims.

Xerox Counters IVC Suit

SAN JOSE, Calif. – Xerox Corp. has filed a counterclaim against International Video Corp. (IVC) seeking $150,000, which includes interest and $102,000 in alleged amounts due for services rendered.

The Xerox action charged IVC failed "to monitor the output from the Interactive Accounting System to insure correctness; failed to develop, install and maintain proper internal work flows, audit procedures and control points; failed to provided proper staffing for installation, development and operation of the Interactive Accounting System; and failed to use the Interactive Accounting System in an efficient and proper manner."

Aided by Super Minis

Mini Market to Hit $3 Billion by 1978

By Molly Upton
Of the CW Staff

SAN FRANCISCO – The minicomputer market, bolstered by a tripling of the super mini market, will quote about $3 billion by 1978, according to Richard W. Anderson, general manager of Hewlett-Packard Co.'s (HP) Data Systems Division.

Within the next 1,000 days, other key changes in the industry will occur in the areas of LSI microprocessors and low-cost personalized systems, he told financial analysts at a conference here recently.

The mini market will grow about 30% annually through 1978, Anderson said. The market for super minis in 1975 will probably double that of 1974 for a value of around $250 million; it now accounts for about 20% of the mini market, he added.

Anderson classified as super minis such machines as Digital Equipment Corp.'s PDP-11/70, Data General's Eclipse, the HP 3000 and Interdata's 8/32.

In line with the increase in the super mini market, the industry is currently undergoing a shift in favor of end-user equipment, which now holds the edge over OEM in both dollars and unit shipments, he said.

The OEM market previously accounted for about two-thirds of industry unit shipments, he said.

25% Mini Growth

Viewing the present, he said 1975 industry mini shipments should reach between $1.4 billion and $1.5 billion and represent a growth of about 25% over 1974.

In past years, the industry has grown by about 30%, he observed.

Profits within the industry should be reasonably consistent with those of the past – about 10% after taxes for the leaders. However, some of the smaller firms will have a worse year, and there will be a shift in market share, he predicted.

The price decline throughout the industry will continue to range between 25% and 30% a year, he added.

For the future, microprocessors and microcomputers "are going to continue to amaze us" with more and more circuitry on a chip. Performance will improve as silicon-on-sapphire chips and LSI come into use.

In addition, Anderson said he sees in the future excellent micros and minis based on micros in the CPU as well as in the controller and I/O devices.

This move will be accompanied by "substantial improvement in software and software development" for micros and "a great deal of progress in micro-based terminals and peripherals," he forecast.

Key technological changes will include increased use of 4K random-access memories (RAM) as well as the debut of the 16K RAM. Along with advances in memory technology will come architectural improvements.

"We will see some really handsome improvements in peripheral price/performance," Anderson said. Already the price of disk memory is improving, he observed.

Muddy Definition

Anderson admitted the definition of the low-cost personalized computer system is muddy, but agreed it is a complete system aimed at the non-DP professional.

It is integrated, with components packaged together rather than racked to reduce price. Personal computers also offer a "more friendly user interface" with self-instructing software.

These systems will have to have good applications packages but, more importantly, "good application examples" so the user can identify his need for such a

(Continued on Page 38)

IBM's Voluntary Transfer Plan Aimed at Beefing Up Branches

By Nancy French
Of the CW Staff

WHITE PLAINS, N.Y. – In an effort to reduce headquarters' overhead for its DP division and beef up its branches, IBM is emphasizing its "standing policy" of encouraging employees to voluntarily transfer to new IBM jobs.

Although the program is expected to extend into 1977, reassignments have started already and most of the moves will occur during 1976, a company spokesman said.

Some individuals who now hold staff responsibilities will be encouraged to accept line responsibilities and even sales jobs in the field.

Others will be encouraged to accept positions in "marketing support and market planning." However, none of these positions will be domotions.

The transfers are expected to reduce the number of employees assigned to headquarters' responsibilities here as well as at the company's regional offices in New York, Chicago and Los Angeles.

Since the transfer program is strictly voluntary, the spokesman said he "could not say" how many employees would be involved ultimately.

IBM has a full-employment "tradition" – it hasn't had a layoff "as long as I can remember," the spokesman said.

With such a "tradition," it is conceivable people will move from positions where they are contributing little to the company's earnings to positions where they could help bring in new business, he explained.

Workload rebalancing is also going on in several of the firm's manufacturing plants

IBM's production-line workers are also eligible for the firm's voluntary transfer program, he said.

Sanders Wants His Name Back

NASHUA, N.H. – The founder of Sanders Associates, Inc. has asked shareholders to remove his name from the title of the company and get rid of all current directors more than 64 years old. Royden C. Sanders Jr. submitted these proposals in proxy statements, prepared for the annual meeting Oct. 25, in which he said he has "no confidence" in the company's present management.

Sanders resigned Feb. 28 and was succeeded by Harold W. Pope, who still heads the firm.

Although a company spokesman said Sanders resigned for "personal reasons," sources attributed his departure to dissatisfaction with the firm's performance expressed by stockholders and lender banks.

Objecting to the board's "domination by older people and the company's own employees," Sanders suggested all persons over 64 be disqualified from serving on the board of directors and that shareholders limit to two the number of employees permitted to serve on the firm's 13-member board.

As for use of his name, Sanders said further use would "cause irreparable damage to my professional and personal reputation."

The board contended Sanders has formed a new company named Sanders Technology Systems, Inc. and therefore has "a potential economic interest" in asking Sanders Associates to change its name.

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RAYTHEON

PTS-1200 Release Called Example of RDS Philosophy

By Molly Upton
Of the CW Staff

WALTHAM, Mass. – Raytheon Data Systems' (RDS) recently released PTS-1200 is an example of the firm's philosophy of selectively building a customer base and then adding hardware and capability to that base, according to Joe Hitt, vice-president of marketing.

The system [CW, Sept. 24], which can be installed on a field upgrade, gives the firm a product that can replace a variety of equipment now found installed at the remote sites of large businesses, Gary Sharpe, product manager, said.

No other firm seems to be addressing the handling of such tasks as data entry off-line within a branch as well as access to central files, Sharpe said, describing the system as more akin to an on-line rather than a time-sharing system.

RDS will market the unit to the central DP sites of its existing base of over 12,000 IBM 3270-type terminals in airlines, insurance, manufacturing and distribution, and banking and credit authorization markets, as well as utilities market, Hitt said. These users will assemble the software and distribute the systems to their branch locations, he explained.



CW Photos by M. Upton

Hitt Sharpe

By providing macros, RDS provides the user with 90% of his needed applications, Hitt said.

The macros are in extremely high-level language with flexibility designed to make the user as self-sufficient as possible, which is in the interest of both the user and RDS, Sharpe added.

Also included with the PTS-1200 is a comprehensive set of programming debugging aids and utilities, he said.

In designing the system, RDS did not set out to adapt the mainframe language to a small machine, he observed, but rather to orient the language toward handling data in a display-oriented environment.

Reflects Quiet Image

In line with Raytheon's admittedly quiet image, the system has been operational for about a year and one-half and 16 units are installed at customer sites.

"One of the differences between profit and loss is the cost of field support," Hitt said, and RDS wanted to ensure documentation and utilities were complete.

In the last two years, RDS, a division of the Raytheon Corp., has been busy establishing its presence in the field and now feels it has a significant customer base upon which to build, Hitt said.

Business has tripled within the last three years and, at the end of last year, the firm was at the $50 million level, he said.

RDS increased its market penetration from 10 to 52 airlines with its reservation and departure control systems and has expanded into its targeted areas within Fortune 500 firms to such an extent that airlines no longer provide the majority of RDS business, Hitt said.

RDS was created in 1971 with the consolidation of Raytheon's terminals, minicomputers and microwave transmission systems.

Terminal Shipments in Majority

RDS currently ships over 1,000 unit/month and about three-quarters of the shipments are the PTS-100 terminal systems.

The division is profitable, Hitt said. Raython Corp. obtains 45% of its business from the military, and RDS is the only commercial division with the Raytheon name, he observed.

As an example of corporate support, the parent firm regards lease financing as an investment, he said.

RDS has a built-in marketer in Europe with Raytheon Europe and also maintains an office in Amsterdam that specializes in marketing to airlines and those needing seismic systems, Hitt said.

The Japanese distributor is Nissho Iwai and there are plans for marketing in South America as well, he said.

Mini Market Seen At $3 Billion in '78

(Continued from Page 37)

package, even if it needs some tailoring, he said.

IBM, he said, is going to be in the mini market and make its presence felt, thereby adding credibility, especially for the super minis, he said.

Anderson predicted one or two semiconductor houses will enter the systems market, and possibly one or two mini makers will integrate backward into the semi market. There will be more mini OEM business going to the micros.

The computer industry should not introduce many products incorporating new technology so quickly that it "leaves the 'i's undotted and the 't's uncrossed," he said.

Although these new improvements are helping to reduce manufacturing costs, the mini maker must beware not to pass on price reductions to the user without considering support costs, which he indicated will be higher as the need for user instruction increases.

Anderson chided the DP industry and said it must do a better job of selling itself to schools at all levels. He sees a shortage of well-trained, creative technical talent as one of the major problems over the next 1,000 days, he said.

In such a dynamic industry, mini makers "cannot sit back and let fortunes ebb with the economy; they have got to make products useful to the market.

"We should not run too lean on engineering talent," he warned.

Not only does he see a shortage of engineering talent, but also of service and customer representatives, he said.

Previously the industry tended to rely on the U.S. armed forces to train people, but this source is drying up with the advent of the volunteer army, he observed.

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Adapso Survey Reports

Service Firm Revenues Up 24% in '74

MONTVALE, N.J. – The average revenues and profits of DP service companies increased by 24% and 9% respectively in 1974 compared with those of the year before, according to the Association of Data Processing Service Organizations' (Adapso) ninth annual industry survey.

Prepared for Adapso by Quantum Science Corp., the survey noted a continuing growth pattern by all segments of the industry during the next five years.

The preliminary report, consisting of 128 responding service companies, did not include a dollar forecast for facility management companies.

The report suggested, however, that government-related facility management contracts may continue to grow at a healthy rate while commercial projects may be showing a slowing trend.

Network information services (NIS) which in 1974 produced $894 million as the most profitable individual industry sector, is expected to grow at an annual rate of 18% and reach $2.409 billion by 1980, the report said.

Software products, on the other hand, which ranked only third in revenues in 1974 with $331 million, is expected to reach $1.351 billion in sales in 1980 for an annual growth rate of 26%, the report predicted.

Software services, which produced $473 million in 1974, will grow 8% annually and hit $732 million by 1980.

Batch services, which ranked second in revenues in 1974, will grow to $1.025 billion by 1980 at a slow 5% annual rate.

Asset Values Up

Despite the national recession last year, the computer services industry reported increases in asset value, net worth and working capital.

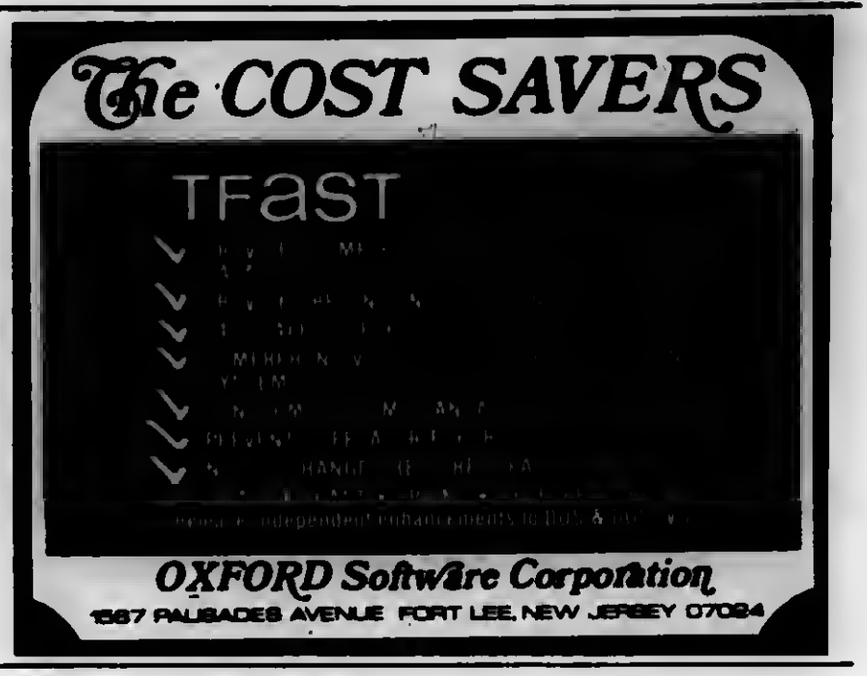
The survey also showed batch companies are moving toward NIS, and it predicted a reduction in the share of revenues contributed by batch services.

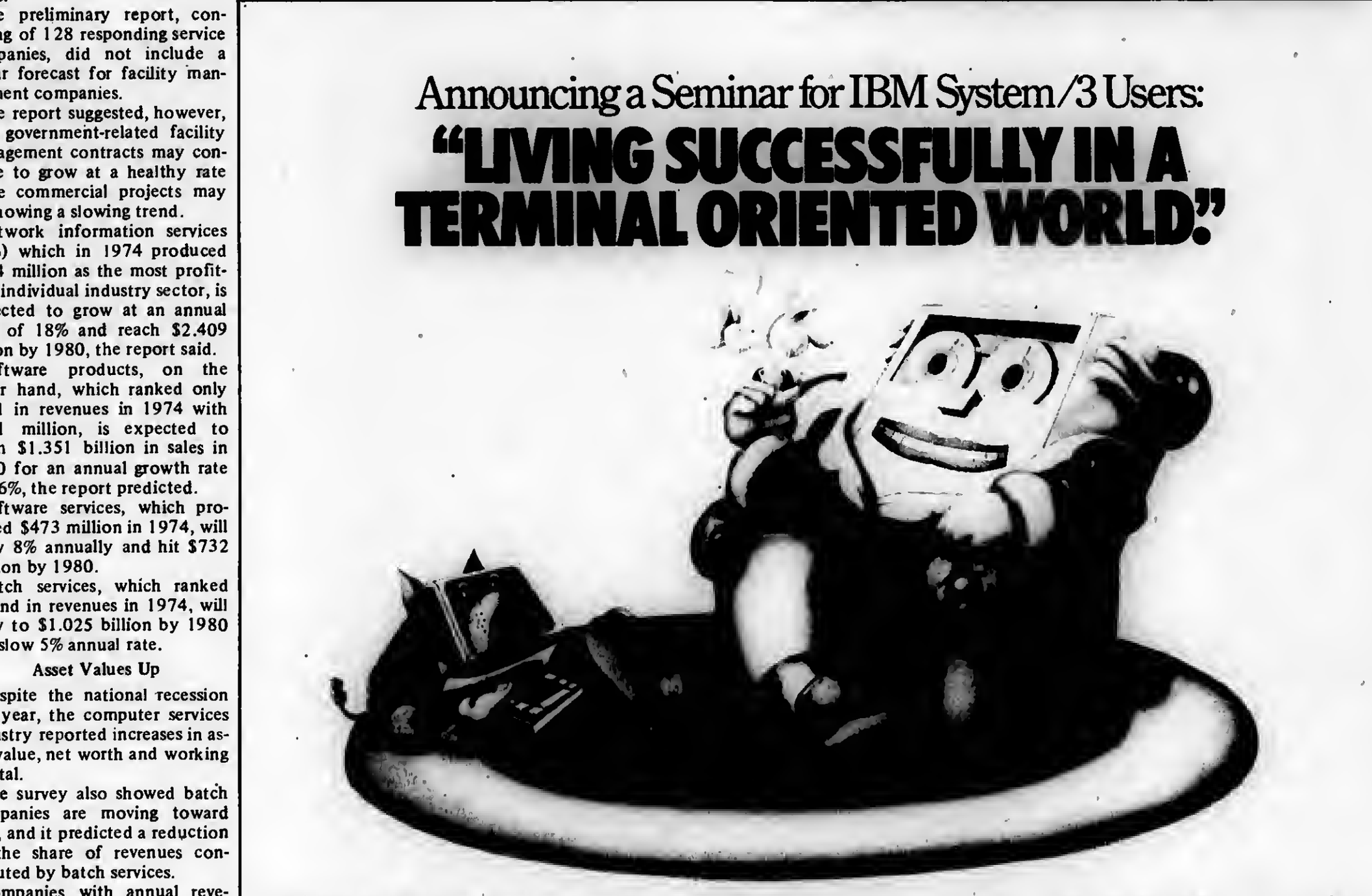
Companies with annual revenues under $2 million, 70% of which reported batch services as their primary source of revenues, forecasted reductions in excess of 30% by 1977. The shift toward NIS appears evident, the report stated.

Similarly, the sale of software products was shown to be an increasing source of revenue for firms in the $500,000 to $2 million annual revenue range, while software service activities were reported to be declining by all but the smallest size firms, the report noted.

Minicomputers and small business systems were indicated as a major source of concern and competition for the industry, second only to competition from other DP service firms.

Data centers are under the double pressure of competition from NIS companies and small in-house computers, the report said, adding they are, however, indicating an awareness of this problem by diversifying and providing multiple product and service offerings.





Terminals are here! And more and more they will mean the difference between increasing productivity and falling behind. Small and medium-sized computer system users who are using inflexible batch processing systems may find themselves unable to take advantage of new data processing opportunities . . . but then you probably know that already.

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The seminar will revolve around the basic subject of how terminals can add flexibility and accessibility to a data processing system. Specific examples will be drawn from individual company solutions to a wide variety of business problems, like order entry, bill of materials, sales analysis, financial management, etc.

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Recession Seen Stunting Growth of European DP Mart

By Nancy French
Of the CW Staff

WALTHAM, Mass. – The continuing recession has slowed expected growth in the European computer market this year, and 1976 expectations reflect a "wait and see" policy toward expansion by computer users.

This preliminary conclusion was released by International Data Corp. (IDC) recently as part of a comprehensive study of data processing in Europe's top-500 corporations.

The corporations surveyed account for an estimated 40% to 45% of the entire European DP market and are representative of computer use throughout Europe, the study said.

Users "will content themselves with making more efficient use of equipment already in-house" to cope with immediate economic difficulties they face, the report said.

IDC researchers learned West German users expect to spend 8.9% more on DP hardware, services and personnel in 1976. With an inflation rate of about 6%, most corporations reported increased spending will be for wages rather than hardware additions.

Cost-cutting alternatives are being introduced instead, the report said, and Siemens, a low-cost West German supplier, is making perceptible gains.

French users indicated budget increases up to about 16.1%, but the inflation rate, expected to drive salaries up 14%, will account for much of that gain.

Upgrades vs. Consolidation

While more mainframe upgrades are anticipated in France than in West Germany, some French users are centralizing and consolidating hardware around larger mainframes, IDC said.

The market research firm conducted personal and telephone interviews at 155 French corporations and 191 West German firms plus their divisions and subsidiaries.

The research effort will continue in the UK, the Benelux group, Switzerland, Austria, Italy, Scandinavia and Spain during the remainder of the year.

The IDC study covered 1,153 user sites, 904 of which fell into the category of "manufacturing and other."

Banking installations, the second highest individual sector, numbered 64, or 5.6% of users surveyed. Sixty steel industry DP sites, or 5.2% of installations surveyed, was the third largest industry sector.

Market Share

In both France and West Germany, IBM held the lion's share of the market, the study found.

International News

In France, for example, a survey of 667 sites showed 54% using IBM gear. Second highest was Honeywell Information Systems equipment, used by 13.8% of user installations.

In West Germany, IBM held even a higher proportion of user sites. Of 316 surveyed, 60.1%, or 190 installations, used IBM equipment. Second highest was Siemens, with 16.5% of the market.

European users seemed to favor using peripherals offered by their mainframe manufacturer. However, researchers noted an economizing trend developing within DP departments to using less expensive independent peripherals.

More than one type of data entry is generally in use. The majority of the corporations surveyed still use cards, although most sites also have or are planning to adopt more economical methods such as key-to-disk or key-to-tape, the findings showed.

Data communications is still in limited use in Europe, the survey found. The high cost of both new equipment and telephone lines has prohibited implementation to date, although many users indicated great interest in expansion into this field, the report said.

Exporters Urged to Heed Rules

By Molly Upton
Of the CW Staff

SAN FRANCISCO – "Full attention to and compliance with export control licensing requirements will pay dividends to the prospective exporter," according to Rauer H. Meyer, director of the Office of Export Administration (OEA) at the U.S. Department of Commerce.

Meyer defined the two kinds of licenses and urged attendees at a recent conference here to be sure to fill out the proper forms correctly to expedite consideration of requests.

High-technology products such as computers, semiconductors, oscilloscopes and other electronic instruments comprise the majority of items on the list requiring validated licenses for export to the socialist countries, he said.

Application for a validated license must be made to OEA on a prescribed form, he said, emphasizing that "delays in the issuance of licenses can be avoided by compliance with the requirements."

General Licenses

The other kind of license is a general license. An exporter whose proposed trade qualifies for this category may proceed without filing a license application or obtaining further authorization from the Department of Commerce, he said.

Certain specified types of technical data may be exported under general licenses such as data generally available to the public in any form and scientific or educational data not significantly related to design, production or utilization in industrial processes.

Also included are: data transmitted in connection with filing for a foreign patent; data normally supplied in support of efforts to sell the product; and data necessary to the assembly, installation, maintenance or operation of a commodity authorized for export, he said.

Specific conditions defining and limiting each of the above generalizations are given in the export administration regulations.

All other technology exported to the socialist countries requires a validated license, he said.

Licensing Considerations

When reviewing applications for a license, OEA considers whether the transaction "would make a significant contribution to the military potential" of any other nation that would prove detrimental to the national security of the U.S.," he said.

A prime consideration is the end use of the product. In most cases, it is necessary to document the foreign parties' intentions as to use, on special consignee statement forms prescribed by the Department of Commerce for this purpose, he said.

Also, technical details of the commodity and pertinent commercial aspects of the transaction "are essential to an expeditious and proper consideration of the application," he said. This would entail identification of the foreign purchasers and any intermediate parties, he explained.

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Intel Officer Says

Filing Patents Abroad Essential Process

By Molly Upton
Of the CW Staff

SAN FRANCISCO – Don't be stingy when it comes to paying fees on file patents and trademarks abroad, Roger S. Borovoy said at a conference here recently.

Although the patent process can be expensive, neglecting this aspect of launching a product can result in losing foreign rights to the invention, the vice-president and general counsel of Intel Corp. said.

Firms should file for patents abroad within a year of the U.S. filing date, otherwise the foreign patent rights may be lost forever, he said.

If, after a couple of years, the invention becomes less important, a firm can abandon the application in some countries and thereby cut costs, Borovoy said.

File in Major Countries

U.S. firms should file in the major European countries, he said, as the product is likely to be manufactured in one of these. Royalty can be collected where the product is made, even though it is subsequently sold in a country where there are no patent rights, he said.

Consideration should be given to filing for patents in the Eastern Bloc countries, although it is unknown how effective such measures are, Borovoy said.

"It is a bit like dropping pennies into a well. You know the pennies are at the bottom, but you don't quite know what value they have down there – and you cannot retrieve them," he said.

There is a proposal for a common market patent, which might be acted on next year, he said. This would save U.S. firms money and allow for only one filing, Borovoy added.

Some countries require a firm to grant licenses on its patent if that firm is not "working the invention" in that particular country. This policy would allow licensees to sell, manufacture or both, he said.

Licensing has two forms: granting either the patent rights alone or the know-how to manufacture the product along with the patent.

In general, it is harder to sell the former, Borovoy said.

Licenses for know-how bring in more money, but also have hidden costs, involving making the know-how available, he said. Generally this requires time and effort as well as travel by key people within the organization.

International News

The U.S. firm must be sure the license specifies that the licensee must keep the know-how confidential. All documents must be properly marked and sufficient logs kept, which requires careful attention and clerical time, he remarked.

In licensing patents, there are two primary ways of collecting royalties: a running royalty or a paid-up license with fixed periodic payments.

A paid-up license is more popular generally, as the licensee tends to be optimistic regarding his volume of business, Borovoy said. The running royalties require detailed reporting of sales that give the licenser key information on sales and product breakdown.

Manufacturing Rights

Although a firm can give a licensee the exclusive rights to manufacture in a particular European country, normally licensees require the nonexclusive right to market the product anywhere in Europe, he said.

"Very few companies in Europe are willing to confine their sales to their own country," he observed.

But, in spite of licensing to market in explicit countries, if a licensee sells the product to a third party in that country, the third party is free to resell the product anywhere in the world, Borovoy said.

Sublicense Incentives

To gain wider sales, the U.S. firm could give the licensee the right to grant sublicenses. Generally, the majority of the royalty would go to the inventor, with a subtantial part to the licensee to give him incentive to grant sublicenses, he suggested.

In Japan, it is especially important to obtain patents on electronic inventions, he said. "There is a distinct advantage in obtaining licensing assistance from a major Japanese company which has both an interest in your particular product and a financial interest in successful licensing," he said.

Trademarks also should be filed early in all the important countries, he said. "Much costly litigation has resulted from neglect by American companies to diligently file their trademarks abroad."

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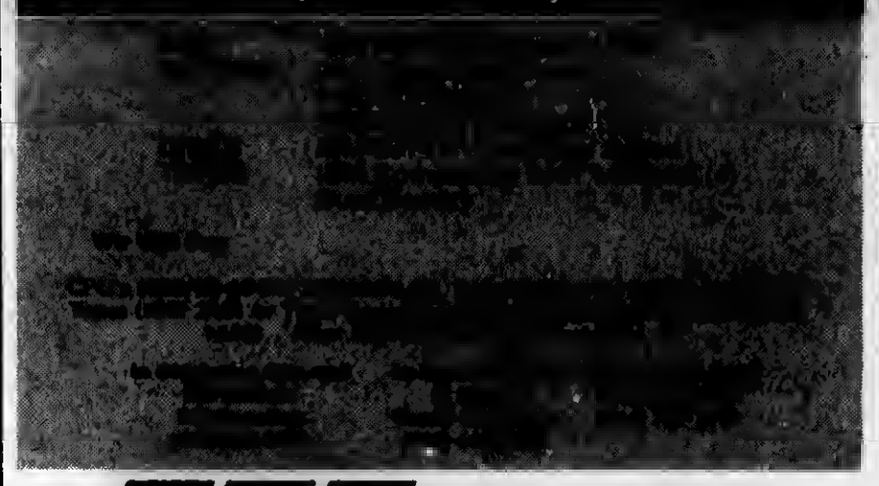
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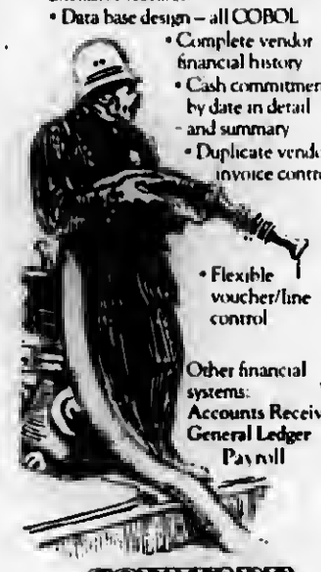
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Pertec '75 Net Increases 120%

EL SEGUNDO, Calif. – Pertec Corp. posted earnings 120% greater than last year on revenues only 46% ahead, setting a new record, according to Ryal R. Poppa, president and chief executive officer.

In addition to the "excellent" results for the fiscal year, ended June 27, the computer peripheral equipment manufacturer's fourth quarter was also the best period in the company's history, the firm said.

Revenues of $13.5 million were realized for the fourth quarter and $48 million for the 12 months. This compared with $9.5 million and $33 million for the same period last year.

Earnings per share were 31 cents for the fourth quarter and 90 cents for the 12-month period. This compsred with 29 cents per share and 41 cents per share recorded in 1974. The 29 cents per share, however, included a gain of 22 cents from the sale of the company's computer output microfilm (COM) operation.

"This year's achievement marks a significant turnaround after three years of progressively declining profits," Poppa said.

"More important, however, was the excellent profit contributions" of two divisions despite a weak economy. The Business Systems Division which was unprofitable last year recorded dramatic increases in both revenues and profits, Poppa said.

"Our Peripheral Equipment Division, which experienced a modest growth rate of 12%, well below its anticipated revenues, was still able to achieve almost 100% of its profit expectations.

"In view of this, we are confident we have attained the turnaround predicted in previous announcements," Poppa added.

MDS Reports Earnings Up For First Fiscal Quarter

PARSIPPANY, N.J. – Mohawk Data Sciences Corp. (MDS) reported a net income of $2 million, or 30 cents a share for the first quarter, which included $685,000 of foreign net operating loss carryforwards, for the first fiscal quarter ended July 31.

This compared with a net loss of $1.9 million or 32 cents a share for the same period last year.

The $2 million first-quarter total net income compared with a net loss of $6.8 million for the same year-ago period.

Revenues for the quarter were $41 million, down from $43 million reported a year ago.

Ralph H. O'Brien, chairman and president, said the reduction in quarter revenues was largely the result of a planned withdrawal from certain OEM and component markets. However, he also noted that interest expenses for the first quarter were below that of the same year-ago period and reflected a reduced level of borrowing and an improvement in interest rates and operating expenses resulting from the company's consolidation program.

Record Income Reported at ACT

NEW YORK – Advanced Computer Techniques Corp. (ACT) scored its most successful year with earnings of $282,210 or 24 cents a share, an 81% increase over the 1974 figure of $155,674 or 18 cents a share.

"While the company has achieved a record year, it would like to do even better and we are continuing to formulate plans to do so," President Charles P. Lecht said.

"We are established in a number of marketplaces and feel confident we can successfully overcome the global economic uncertainties which may prevail during 1975/1976," he said.

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Orders & Installations

The Naval Surface Weapons Center, Dahlgren Laboratory, has ordered a Control Data Corp. Cyber 70 to support the Fleet Ballistic Missile program.

The Minneapolis Police Department has purchased 35 mobile digital communications terminals from Kustom Data Communications, Inc. to enhance law enforcement communications.

Citizens Federal Savings and Loan Association of Dayton, Ohio, has ordered an on-line system from NCR which includes a Century 251 computer, 23 NCR 270 electronic teller terminals and 11 NCR 796 visual display terminals.

Seven Digital Equipment Corp. PDP-15/78 computer graphics systems have been ordered by Bell Telephone Laboratories.

Raygo, Inc. has installed a 48K NCR Century 101 and three visual display terminals to help control manufacturing operations.

The Federal Home Loan Bank of Chicago has installed a Burroughs B7700 to take over DP services for 150 savings and loan associations.

Johnson City, Iowa has ordered a Hewlett-Packard mini data center system to manage administrative functions.

Home Savings and Loan Association of Los Angeles has ordered 300 Olivetti TC 800 terminals for installation after the completion of a pilot installation starting in October.

First National Bank of Omaha has installed 18 NCR 279 financial teller terminals in 14 Safeway supermarkets and four Richman-Gordman department stores as part of a network of customer service terminals.

The Bank of New Orleans and Trust Co. has ordered a Burroughs B776 system and communications processor and 20 S5100 systems for a centralized proof and transit operation.

Electric Service & Supply Co. has ordered a Univac 90/30 to implement an on-line order entry system.

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Earnings Reports

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Three Months Ended June 30

	1975	1974
Shr Ernd	$.76	$.73
Revenue	6,711,000	5,198,000
Tax Cred	.....	68,000
Earnings	1,172,000	1,070,000
9 Mo Shr	2.22	2.00
Revenue	19,040,000	12,354,000

ACADEMY COMPUTING
Six Months Ended June 30

	1975	1974
Shr Ernd	$.06	$.04
Revenue	428,464	341,794
Earnings	85,797	55,286

INTERCONTINENTAL COMPUTING
Three Months Ended June 30

	1975	1974
Shr Ernd	$.03	$.03
Revenue	757,772	912,308
Earnings	34,191	39,141
6 Mo Shr	.09	.04
Revenue	1,580,839	1,560,440
Earnings	110,249	48,988

INFORMATION INTERNATIONAL
Three Months Ended July 31

	1975	1974
Shr Ernd	$.19	$.18
Revenue	3,308,678	2,531,348
Earnings	477,746	449,013

STANDARD COMPUTER
Six Months Ended June 30

	1975	1974
eShr Ernd	$.05	$.59
Revenue	2,970,000	3,204,000
Earnings	28,000	357,000

a-Per-share earnings computed after adjustment for reverse stock split of one for 7.5 shares effective May 26, 1975.

SYNCOM
Three Months Ended June 30

	1975	1974
Shr Ernd	$.02	.....
Revenue	818,268	$615,608
Earnings	26,841	(30,891)

NASHUA
Three Months Ended June 27

	1975	a1974
Shr Ernd	$.06	$.90
Revenue	80,918,000	83,730,000
Earnings	280,000	4,149,000
6 Mo Shr	.39	1.50
Revenue	155,197,000	155,025,000
Spec Cred	b1,366,000	.....
Earnings	1,821,000	6,922,000

a-Restated to reflect Lifo method of valuing inventories. b-Cumulative effect on prior years from accounting change.

COMPUCYNE
Three Months Ended June 30

	1975	a1974
Shr Ernd	$.04	$.01
Revenue	9,739,644	7,713,731
Earnings	192,134	94,304
9 Mo Shr	.09	.02
Revenue	29,906,595	22,187,426
Earnings	463,745	223,299

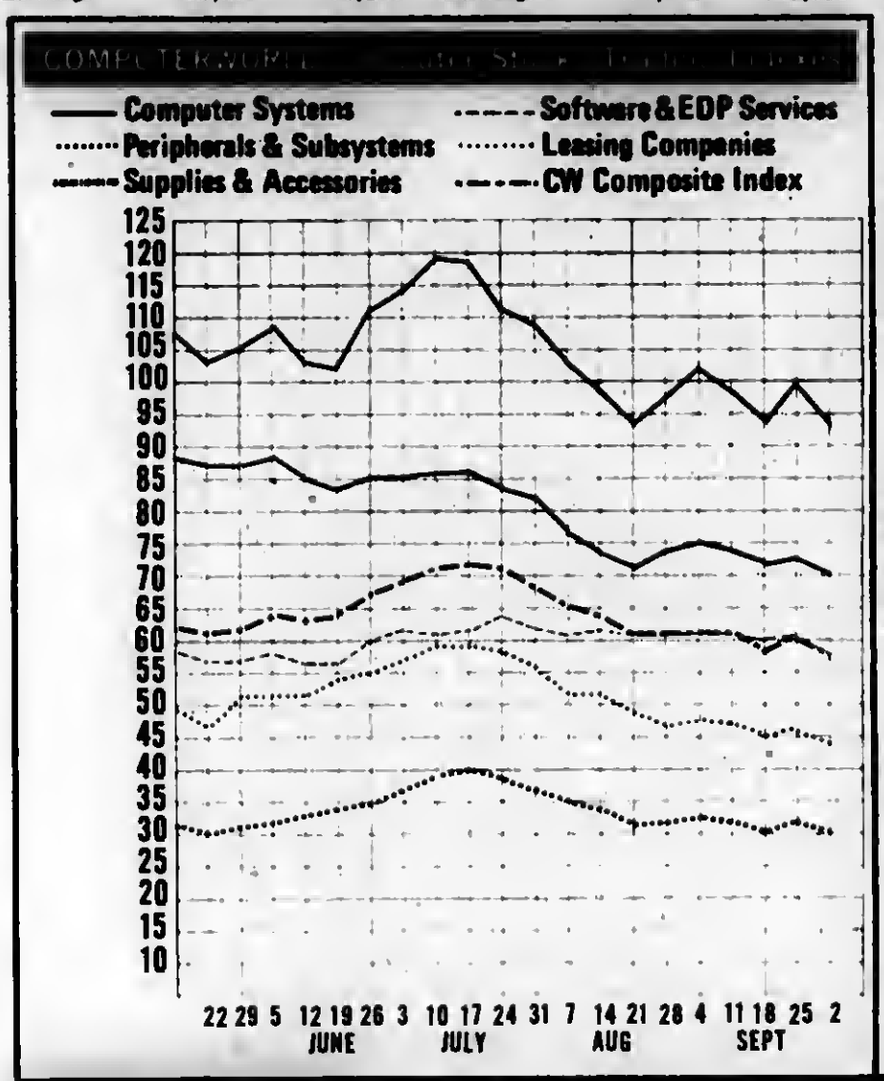
a-Restated to reflect change to Lifo accounting method.

AOAGE
Three Months Ended June 28

	1975	1974
Shr Ernd	$.41	$.07
Revenue	1,598,959	1,153,046
Spec Cred	210,000	14,000
Earnings	325,299	53,690

DATATAB
Three Months Ended June 30

	1975	1974
Shr Ernd	.....	$.04
Revenue	$1,078,219	1,254,954
Tax Cred	71,700	.....
Earnings	(67,120)	30,881
6 Mo Shr	.....	.11
Revenue	2,236,265	2,507,394
Tax Cred	71,000	.....
Earnings	(65,657)	82,575



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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOSEP 1, 1975

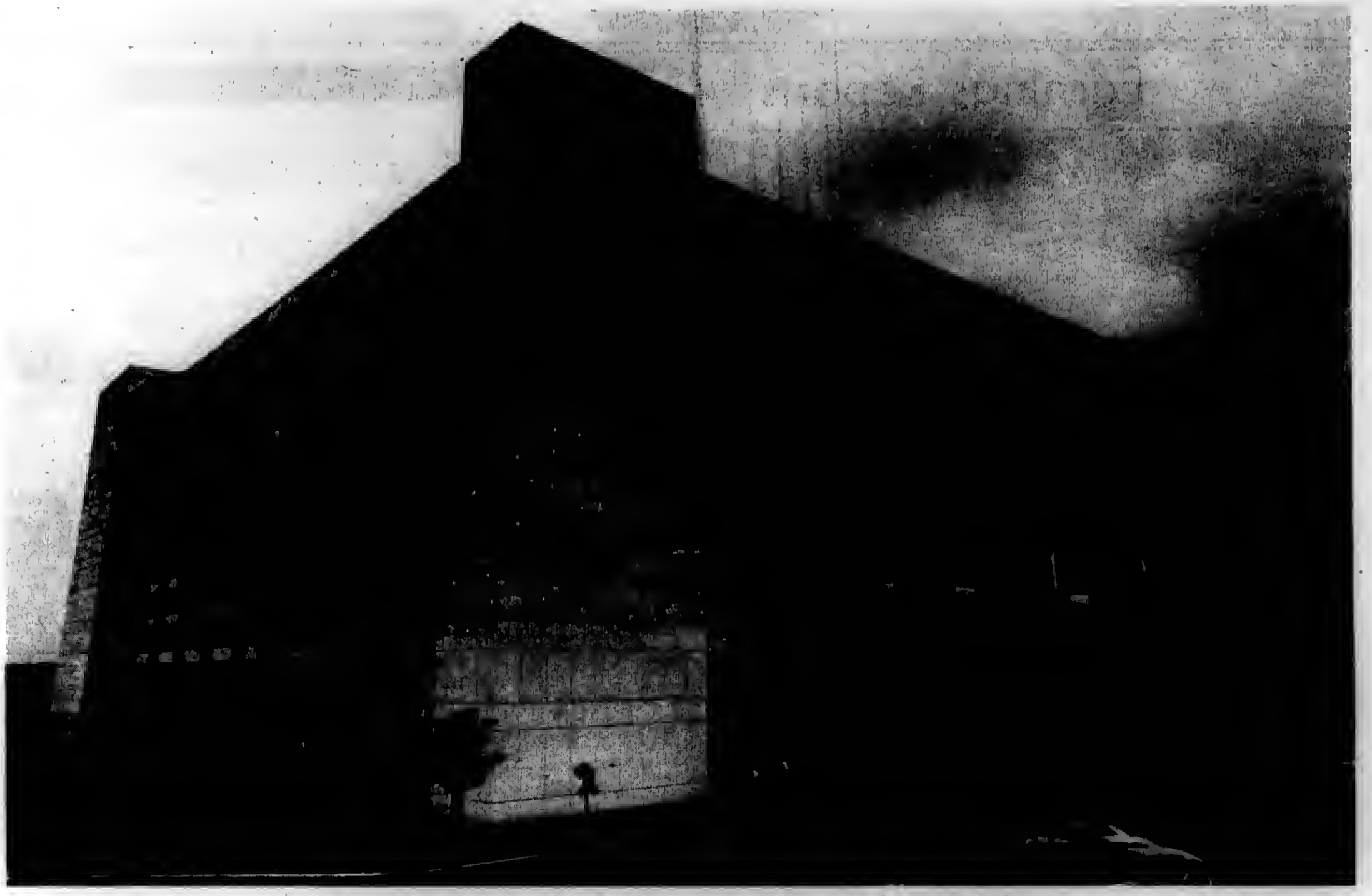
All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

F X C H		1975 RANGE III	CLOSE OCT 1 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	96 3/8	-3 3/8	-3.7
O	COMPUTER AUTOMATION	2- 13	8 1/4	-1 1/2	-15.3
N	CONTROL DATA CORP	11- 23	16 5/8	+ 1/4	+1.5
N	DATA GENERAL CORP	10- 38	28 1/8	-2 7/8	-9.2
O	DATAPOINT CORP	6- 26	20	-1 1/4	-5.9
O	DIGITAL COMB CONTROL	1- 4	2 1/2	0	0.0
N	DIGITAL EQUIPMENT	46-122	111 3/4	-8	-6.6
N	ELECTRONIC ASSOC.	2- 3	2 1/4	- 1/2	-18.1
A	ELECTRONIC ENGINEER.	6- 10	8 3/4	+ 1/8	+1.4
N	FOXBORO	23- 42	24 3/4	-1 1/2	-5.7
O	GENERAL AUTOMATION	6- 14	6 3/8	- 3/8	-5.5
O	GRT COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	55-121	94 5/8	-2	-2.3
N	HONEYWELL INC	72- 40	27 5/8	-1 1/4	-4.3
N	IBM	158-224	193 3/8	-7 5/8	-3.8
O	MEMOREX	1- 11	6 5/8	- 1/2	-7.0
O	MICRODATA CORP	2- 6	5 3/4	+ 1/8	+2.2
C	MODULAR COMPUTER SYS	5- 19	11 1/2	-2	-14.8
N	NCR	15- 39	24 3/4	- 3/4	-2.9
O	PRIME COMPUTER INC	2- 6	4 3/4	0	0.0
N	PERKIN-ELMER	16- 31	22 1/8	- 3/4	-3.2
N	RAYTHEON CO	24- 58	49 3/4	-4 3/4	-9.7
N	SINGER COMPANY	11- 17	11	- 1/2	-4.3
N	SPERRY RAND	26- 40	38 3/4	-1 1/2	-3.7
A	SYSTEMS ENG. LABS	1- 5	3 1/8	- 1/4	-7.4
N	VARIAN ASSOCIATES	7- 18	13 3/8	-1 3/8	-9.3
N	WANG LABS.	7- 17	9 1/4	-1 3/4	-15.9
N	XEROX CORP	51- 86	53 1/4	- 3/4	-1.3
	LEASING COMPANIES				
O	CONDISCO INC	1- 5	3 3/8	- 1/4	-6.8
A	COMMERCE GROUP CORP	2- 4	2 1/2	- 1/8	-4.7
A	COMPUTER INVSTRS CRP	1- 2	5/8	-	-9.1
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	0- 1	1/2	0	0.0
N	DPF INC	3- 6	4 1/8	- 1/4	-5.7
O	FOR RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/8	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 7/8	- 1/8	-4.1
A	ITEL	3- 9	9 5/8	- 7/8	-13.4
N	LEASCO CORP	4- 5	6 1/2	+ 1/8	+1.9
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NPC INC	0- 4	5/8	- 1/8	-16.6
A	PIONEER TEK CORP	2- 7	9 1/8	+ 1/8	+2.5
A	ROCKWOOD COMPUTER	1- 1	1/4	0	0.0
N	U.S. LEASING	7- 14	6 1/2	- 3/4	-10.3

F X C H		1975 RANGE III	CLOSE OCT 1 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	3/4	- 1/8	-14.2
A	APPLIED DATA RES.	1- 10	1 5/8	- 1/8	-7.1
N	AUTOMATIC DATA PROC	29- 65	47	-3	-6.0
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	CENTRAL DATA SYSTEMS	3- 7	7 1/4	+ 1/8	+1.7
O	COMPUTER DIMENSIONS	2- 6	3	0	0.0
O	COMP ELECTION SYSTMS	3- 6	4 3/4	- 1/4	-5.0
O	COMPUTER HORIZONS	1- 1	7/8	- 1/8	-12.5
O	COMPUTER NETWORK	1- 3	2 5/8	0	0.0
N	COMPUTER SCIENCES	9- 6	5	- 1/8	-2.4
O	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
O	COMPUTER USAGE	2- 4	2	- 1/8	-5.8
C	COMSHARE	3- 4	2 5/8	+ 1/8	+5.0
O	DATATAB	1- 2	1 1/8	- 1/4	-18.1
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 29	15 1/2	- 7/8	-5.3
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
O	KEANE ASSOCIATES	2- 3	2	0	0.0
O	KEYDATA CORP	2- 3	2	- 3/8	-15.7
O	LOGICON	3- 5	3 3/4	0	0.0
A	MANAGEMENT DATA	1- 3	1 3/4	- 1/8	-6.6
O	NATIONAL CSS INC	6- 14	11 1/4	- 5/8	-5.2
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	9- 17	11	- 1/8	-1.1
N	PLANNING RESEARCH	2- 6	3 3/4	0	0.0
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	2 5/8	- 1/2	-16.0
O	REYNOLDS & REYNOLD	13- 24	12 1/2	-1	-7.4
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/4	0	0.0
O	TYMSHARE INC	7- 21	16 1/4	-1 3/4	-9.7
A	URS SYSTEMS	2- 4	3	- 1/4	-7.6
N	WYLY CORP	2- 4	3 1/8	+ 1/8	+4.1
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	7 3/8	0	0.0
O	ADVANCED MEMORY SYS	1- 7	5 1/4	+ 3/8	+7.6
N	AMPEX CORP	3- 7	5 3/8	- 1/4	-4.4
O	ANDERSON JACOBSON	1- 3	1 7/8	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 5	3 1/2	+ 1/8	+3.7
A	SOLT,BERANEK & NEW	9- 13	9 1/4	- 5/8	-6.3
N	BUNKER-RAMO	4- 8	4 5/8	- 1/8	-2.6
A	CALCOMP	4- 7	3 5/8	- 3/8	-9.3
O	CAMBRIDGE MEMORIES	2- 5	2 3/8	0	0.0
N	CENTRONICS DATA COMP	7- 25	15	-3	-16.6
O	CODEX CORP	15- 38	30	-6 1/2	-17.8
O	COGNITRONICS	1- 2	5/8	- 3/8	-37.5
O	COMPUTER COMMUN.	1- 2	3/4	0	0.0
O	COMPUTER CONSOLES	3- 7	4 1/4	3	0.0
A	COMPUTER EQUIPMENT	1- 2	1 5/8	- 1/4	-13.3
O	COMPUTER MACHINERY	1- 2	1 1/8	- 1/8	-10.0
O	COMPUTER TRANSCEIVER	1- 2	3/4	- 3/8	-33.3
O	CONTEN	2- 5	2 7/8	0	0.0
N	CONRAC CORP	12- 23	18	-1 1/4	-6.4

F X C H		1975 RANGE III	CLOSE OCT 1 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	5- 16	8 5/8	- 5/8	-6.7
A	DATA PRODUCTS CORP	2- 6	3 5/8	- 3/8	-9.3
O	DATA TECHNOLOGY	1- 3	1 3/4	0	0.0
O	DATUM INC	1- 2	1 1/8	- 1/8	-10.0
O	DECISION DATA COMPUT	4- 7	3 7/8	- 3/8	-8.8
O	DELTA DATA SYSTEMS	1- 1	1/4	+ 1/8	+100.0
O	DIZAN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	1 1/2	- 1/4	-14.2
O	FABRI-TEK	1- 1	7/8	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	3- 6	3 3/4	- 1/4	-6.2
N	HARRIS CORP	18- 28	22 1/4	+ 1/4	+1.1
A	INFOTRON CORP	3- 12	9 3/8	- 1/2	-5.0
O	INFOREX INC	2- 5	2 1/4	- 3/8	-14.2
O	INFORMATION INTL INC	8- 14	10 3/4	+ 3/8	+3.6
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	MILGO ELECTRONICS	8- 24	14 1/2	-2 5/8	-15.3
N	MOHAWK DATA SCI	1- 5	3 1/8	- 1/2	-13.7
O	OPTICAL SCANNING	1- 3	2 5/8	- 3/8	-12.5
O	PENRIL CORP	2- 2	1	- 1/8	-11.1
O	PERTEC CORP	2- 8	4 3/8	+ 1/8	+2.9
A	POTTER INSTRUMENT	2- 2	1 3/4	1	0.0
O	PRECISION INSTR.	1- 1	1/2	- 1/8	-20.0
O	QUANTOR CORP	2- 6	4 1/2	- 1/2	-10.0
O	RECOGNITION EQUIP	2- 9	5 7/8	- 3/8	-6.0
N	SANDERS ASSOCIATES	3- 11	7 1/8	- 1/2	-6.9
O	SCAN DATA	1- 3	1 5/8	- 1/8	-7.1
O	STORAGE TECHNOLOGY	6- 17	12	- 5/8	-4.9
O	SYCOR INC	5- 15	12 1/2	-1	-7.4
O	T PAP INC	3- 6	6 1/4	+ 1/4	+4.1
O	TALLY CORP.	1- 5	3	- 1/4	-7.6
O	TEC INC	1- 4	2 3/4	- 1/4	-8.3
N	TEKTRONIX INC	19- 41	37 5/8	+ 5/8	+1.6
N	TELEX	1- 3	2 1/3	0	0.0
O	WANGCO INC	4- 9	5	- 1/4	-4.7
O	WILTEK INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 1/2	- 1/4	-5.2
A	BARRY WRIGHT	5- 7	6	- 1/8	-2.0
O	CYBERMATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	32	- 1/2	-1.5
O	DUPLEX PRODUCTS INC	12- 25	15 1/8	- 3/8	-2.4
N	ENNIS BUS. FORMS	5- 7	7 7/8	- 1/8	-2.5
O	GRAHAM MAGNETICS	5- 10	7 3/4	- 3/4	-8.8
O	GRAPHIC CONTROLS	8- 21	11 1/4	-2 1/4	-16.6
N	3M COMPANY	43- 69	49 5/8	-4 3/8	-8.1
O	MOORE CORP LTD	39- 51	43 1/4	-1 3/4	-3.8
N	NASHUA CORP	11- 22	11 3/4	- 1/4	-2.0
O	STANDARD REGISTER	11- 20	15 1/2	- 3/4	-4.6
O	TAB PRODUCTS CO	4- 8	6	0	0.0
N	UARCO	17- 24	18 1/4	- 3/4	-3.9
O	VANTER GRAPHICS CORP	4- 7	4 1/2	0	0.0
A	WABASH MAGNETICS	3- 5	3 7/8	+ 1/8	+3.8
N	WALLACE BUS FORMS	15- 25	16 1/4	- 1/4	-1.5

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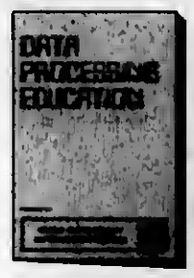
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NEWSPAPER

End Comes for Telex vs. IBM

TULSA, Okla. – Faced with the choice of rags or riches, Telex blinked and negotiated a settlement of its antitrust suit against IBM just 72 hours before the Supreme Court was to hand down its decision on whether it would hear the case.

The settlement called for no payments of any kind between the parties. IBM released Telex from an obligation to pay $18.5 million as the result of IBM's countersuit on trade-secret charges, and Telex agreed not to pursue its antitrust claims.

The negotiations leading to the settlement were initiated by Telex three weeks before it was signed, with the most intense negotiations coming in the three days before the pact was initialed.

The suit was settled with prejudice, which bars Telex from ever bringing the charges again, ending one of the most dramatic private antitrust cases of the past 50 years.

The case resulted in IBM being handed its first antitrust defeat of the computer era, but IBM's persistent pursuit of its case won it a stunning reversal on appeal.

The move to the Supreme Court was to be the final act in the play, but the settlement negated the final scenes.

Reaction was predictable. "Under the circumstances, IBM felt there

(Continued on Page 2)

IBM Planning Attack On Antitrust Judge?

By Edith Holmes
And E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – A mystery document filed with the Second Circuit Court of Appeals here last week indicated IBM may be planning an attack on Federal District Court Judge David N. Edelstein, who is hearing the government's antitrust suit against the firm.

The document, which was quickly sealed from public view almost as fast as it was presented to the appeals court, apparently claimed actions taken by the judge in the case have hurt IBM's defense.

Looking at the docket in U.S. vs. IBM, the only paper filed which could possibly require review by the appeals court involves Edelstein's denial of a request by IBM that it be allowed to interview government witnesses before they appear on the stand without a transcript of such interviews.

The IBM order to show cause, which Edelstein denied, claimed confidential interviews were "essential in preparing a proper cross-examination," but glossed over the fact that IBM had originally asked for the transcripts of such interviews at a pretrial hearing last May.

Specifically, IBM encountered difficulties with government witnesses from General Electric who refused interviews on May 13 and again on Sept. 3 because of the order requiring a transcript.

This apparently led IBM to file an application for an order to show cause with the district court on Sept. 23, which the Judge denied on Oct. 3.

There have been several other clashes between IBM attorneys and the judge over his handling of the case, with IBM attorneys often expressing their dis-

(Continued on Page 5)

'Faster Than 370/168'

Michigan Accepts Amdahl 470 After Tests

By Don Leavitt
Of the CW Staff

SAN FRANCISCO – After two months of tests and production work on the IBM 370-compatible Amdahl Corp. 470V/6 installed on-site [CW, Sept. 10], the University of Michigan Computing Center has accepted the new machine, according to Al Emery, manager of the evaluation effort at the university.

Emery told the opening technical session of the Computer Management Group's (CMG) national meeting here last week that the study period was obviously too short to exercise the physically small but fast new computer system completely.

The tests have been extensive enough, however, "to satisfy us the machine can perform the work we need done. And clearly it is faster than the 168" with which it was compared.

The test was limited to a special time-sharing environment utilizing the home-grown Michigan Terminal System (MTS). Later in the presentation, Emery's companion, senior systems research programmer Mike Alexander, warned the audience the results they obtained are "totally irrelevant to any other operating system."

Moments later, however, he said that – in his mind, at least – "there is no question the Amdahl machine is superior to the 370."

At the same time, its compatibility with the IBM gear was appreciated. It meant, for one thing, the university had a complete, working system with which to test the Amdahl machine.

It also meant the system could be and was switched back to the 370/168 on the one occasion the university suffered serious downtime with the Amdahl equipment. And the change in machines meant the Amdahl downtime was utterly transparent to the terminal users.

Good Test Situation

MTS was a good test situation for the evaluation, Emery indicated, because it is an operating system, originally built for the IBM 360/67, with a multiprogramming supervisor and various other components that aid in measurement and control of how the system is being used. It also works with either interactive or batch jobs.

Statistics-gathering facilities are available at various levels within MTS. CPU time is collected routinely for each task along with the number of pages read for each task. For batch jobs, this data is sent along to a record tape for later analysis and billing of customers.

Ford Names Commission on EFTS

By a CW Staff Writer

WASHINGTON, D.C. – President Ford has finally nominated a chairman and public members to the National Commission on Electronic Funds Transfer, a study group which he signed into existence almost a year ago.

The commission will study and then "recommend appropriate administrative action . . . in connection with the possible developments of public or private electronic fund transfer systems [EFTS]," the White House said.

Ford nominated retired U.S. Congressman William B. Widnall of Saddle River Borough, N.J., as chairman of the commission.

Members representing industry include Verne S. Atwater, president of Central Savings Bank in New York City; Roy G. Green, president of the Fidelity Federal Savings and Loan Association in Jacksonville, Fla.; Herb Wegner of the Credit Union National Association; and Gordon Worley, executive vice-president of Montgomery Ward.

Also, George W. Waters, executive vice-president of the American Express Co.; John J. Reynolds, president of Interbank Card Association; and Richard D. Hill, chief executive officer of the First National Bank of Boston.

Nominees from outside the industry in-

(Continued on Page 2)

Course of Telex vs. IBM Shaped by Personalities

By E. Drake Lundell Jr.
Of the CW Staff

The impossible dream turned into a nightmare for Telex executives in the dusty old town of Oklahoma City on Jan. 24.

And since that day, when their dream of beating IBM in the legal arena started crumbling, they lived with the nightmare. It finally broke their resolve a week ago.

Led by cocky, assertive Roger Wheeler, the Telex chairman and a major investor, the firm decided three years and seven months ago to try to beat IBM in the courtroom – a feat it had not been able to accomplish in the marketplace in the five previous years, when it had entered the peripherals marketplace at the urging of users dissatisfied with poorly operating IBM tape drives.

Except for the essentially faceless IBM executives who communicate with the public through a screen of publicity people, Wheeler was one of the most hidden people in the case.

An aggressive executive, Wheeler took over an ading hearing-aid maker years ago and turned it first into a minor name in the "hi-fi" field – when that term was popular – and then into the first "plug-compatible peripherals manufacturer" – before that term was fashionable – at the urging of Dupont Corp., a user that could not accept the deficiencies in IBM equipment, especially at IBM prices.

Other stories on the Telex-IBM settlement on Pages 6 and 47.

Wheeler, in his pastel-colored, California-salesman-style suits complete with white shoes, still looks fit enough to challenge most welterweights, a dying fighting breed. And he was one of the few men in the industry at the time to turn down an IBM settlement offer made in the early rounds of antitrust litigation.

The $5 million to $10 million offered by IBM before the trial started would have been quite a boost to Telex – and certainly better than the empty hat Wheeler and Telex came up with in the final settlement.

But Wheeler alone is not the whole story of the case, which ended in frustration after three years and seven months; he is not even most of it. The cast of characters is large and varied – people who bet their fortunes, reputations and egos on the case. And some who did it as just another job.

People are the story here, not abstract legal principles – even though they, too, have their place and importance.

The story always had the David against Goliath aura – the weak challenging the strong, the small battling the large, the powerless striving against the powerful.

The IBM publicity army often negated any possible public sympathy with startling – and often true – accounts about Telex's theft of trade secrets and industrial espionage.

(Continued on Page 4)

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In Privacy Act Interpretation

OMB Settles Dispute On Data Disclosure

By Nancy Freneh
Of the CW Staff

WASHINGTON, D.C. – The Office of Management and Budget (OMB) stepped in last week to help congressional caseworkers obtain personal information about constituents that agencies have been denying them because of "overly conscientious" interpretation of the Privacy Act of 1974.

The caseworkers here as well as in home district offices were denied information needed to help constituents resolve difficulties with government agencies.

OMB officials met with representatives from the three largest agencies with which caseworkers were experiencing difficulties – the Department of Defense; the Department of Health, Education and Welfare; and the Veterans Administration.

"In many cases, caseworkers were being denied access to information that would have been available under the Freedom of Information Act," an OMB spokesman said.

The solution involved publishing an additional "routine use" for agencies' computerized or manual personal information files and will become effective in 30 days, the OMB spokesman explained.

The new provision would permit disclosure "to a congressional office from the record of an individual in response to an inquiry from the congressional office made at the request of that individual."

The provision was issued in a letter from OMB Director James Lynn to heads of the three agencies involved and published in the *Federal Register*.

Rep. Bella Ahzug (D-N.Y.), chairwoman of the House Government Committee's Subcommittee on Government Information and Individual Rights, entered the routine use in the *Congressional Record* as a "warning to government agencies" that have been causing problems, a source said.

Before the new routine use becomes effective, agencies are being asked to accept a "liberal standard of proof" of consent from the individual involved, the OMB spokesman said.

"If a congressional staff caseworker says 'we have the written consent of John Doe' on this request, that should be enough," he said.

Individual congressional offices are setting up procedures to deal with the problem of establishing consent, especially in the case of "walk-ins" in district offices.

Procedural Changes

A staff member for privacy proponent Rep. Barry Goldwater Jr. (R-Calif.) said some simple procedural changes may have to he made in handling requests from constituents made by telephone or on personal visits.

The changes will include use of a simple release form to verify "written consent," he said.

When constituents' requests for assistance are made by phone, caseworkers will continue to contact agency congressional-relations people by phone on the basis of "implied consent" in accordance with previous practices.

"At the same time such a request is initiated by the caseworker, he will mail the constituent a copy of the release which simply states 'I authorize (name of congressman and district) to use whatever personal information is necessary to help solve my problem, which is as follows,' " he said.

Space will be provided for a brief description of the problem.

Or caseworkers can simply ask agency employees to convey the information requested directly to the constituent, which is how the majority of written requests are handled, he said.

"Of our annual case load of about 2,000 individual requests, all but about 200 are letters," he said. "We buck many of these to the agency and never see the correspondence it sends to the individual," he said.

"While the present problem appears to have been straightened out, unfortunately it happened without resolving the question of third-party access," the OMB spokesman said.

"In a 'mother/son' type of case, where no real emergency or matter of health or safety is involved, it appears the law would make it illegal to release personal information, even to a family member."

Telex vs. IBM Comes to an End

(Continued from Page 1)

wasn't any point to continuing the litigation," IBM stated. The other firms suing IBM claimed the settlement would not affect their cases.

Computer Industry Association President A.G.W. Biddle called the settlement a "gross miscarriage" of justice which underlined the "urgent" need for congressional action to strengthen the antitrust laws.

Most observers attributed the settlement to the fact Telex would have had to go into bankruptcy if the Supreme Court had decided not to hear the case or ruled against it on the appeal.

Last June the firm admitted it would not be able to pay the $18.5 million IBM had won on its counterclaim if that claim was upheld either hy a refusal of the high court to hear the case or by a decision by that court ruling against Telex's antitrust claims while still upholding the IBM counterclaims.

At the same time, Telex has been profitable during the past year, leading the company executives to the decision not to risk the firm's future.

EFTS Unit Nominated

(Continued from Page 1)

clude Fairfax Leary Jr., professor of law at Temple University; Ralph F. Lewis, editor of the *Harvard Business Review*; Almarin A. Phillips, dean of the School of Public and Urban Policy, University of Pennsylvania; and Freyda P. Koplow, former Massachusetts state banking commissioner.

Also, James E. Faris, director of the Indiana Department of Financial Institutions; and William B. Lewis, deputy commissioner of New Jersey's Department of Banking.

The nominees still await confirmation by the Senate.

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In Case Shaped by Personalities

Impossible Dream Turned Into Nightmare for Telex

(Continued from Page 1)

Those accounts tarnished Telex's image irreparably in the popular mind: Possible theft is more understandable than the possible misuse of market power.

In the end, the case did not boil down simply to good against bad, morality vs. immorality or completely right against wrong.

It encompassed the possibilities of good and evil on both sides; the issues of IBM's alleged marketing practices and Telex's alleged thefts showed the Janus-like nature of the industry, in which right and wrong may be intertwined and possibly intermixed in the same organization.

Others Faltered

Control Data Corp., a large mainframe maker, a whole host of small competitors and even the U.S. government had not been able or willing to bring IBM to the bar in the courtroom.

The only other attempt – by Greyhound Computer Corp. – ended with a dismissed case in another dry, dusty Western town. The jury of housewives, retirees and car dealers never got to hear the IBM defense because the judge in the case accepted the IBM arguments before they were even presented.

But while a dozen others had faltered in pursuing antitrust cases against IBM, the unique combination of people at Telex made the firm persevere until the stakes got too high when the case reached the final round in the Supreme Court.

Wheeler, as chairman of the board, was ready for the fight. Tired – in his view – of being intimidated in the marketplace, he appeared to be enough of a scrapper to take the battle to a new arena where he apparently felt the referee was more impartial or less subject to pressure.

And there were other scrappers on his staff, including Steve Jatras, Telex president, and, perhaps most important, Harry Ashbridge, a marketing support executive who disliked being "pushed around" almost more than the heroes in the old Westerns.

And the lawyer chosen by the firm – Floyd Walker – fit that mold, too, perhaps to an archetypical extent.

If Jatras had never been a sports figure, he wasn't the trim fighter type of Wheeler, but the slightly slow and a bit overweight guard on the junior varsity football team in high school.

But confident. Ready to go and sacrifice his time and effort in a struggle which, from the beginning, must have seemed a dream.

Confident. Feeling that the "right" was with Telex. Predicting – in his one remark to reporters during the entire trial – "We're going to win – big. Just wait and see." That prediction came a month before the original decision for Telex in district court.

Jatras joined Ashbridge and Walker on the Telex team and devoted full time to the case, ignoring company business for a full year during which Telex fortunes took a turn from bad to worse.

But of the executives from Telex, perhaps Ashbridge was the real sparkplug for their effort. The lean, sportily dressed marketing man put in 16-hour days on a seven-day-a-week basis, foregoing the restful pleasures of his small ranch 40 miles outside of Tulsa, Okla., the company's headquarters.

That year of effort ended with Ashbridge being the first witness to take the stand, understandably nervous in a medium-blue suit with lighter blue stitching, at least at first when the enormity of the undertaking must have hit with full force.

But in his second and then third day on the stand, he gained confidence and strength, particularly under the late parts of the cross-examination after the IBM legal army had unloaded most of its biggest guns.

Immediately after that testimony, Ashbridge discovered what had been happening to Telex in the year he and Jatras had been devoting all of their efforts to the case and he left for greener pastures.

His voice was not one of those heard during the debates over whether the company should pursue the matter up to the Supreme Court. He probably would not have urged giving in – and perhaps would have made a difference.

Walker was the perfect lawyer for the case. The craggy-faced, slow-talking Westerner wanted to make enough money to "piss on the oil men" of hometown Tulsa – and he probably would have been able to if Telex had won under his contingency fee structure.

Walker seems to have an ingrained Western sense about large Eastern corporations and concentrations of economic power. He, moreover, translated that mistrust into hard work in the preparation phases of the trial against IBM, marshalling the IBM documents that he relied on in trying to prove IBM's intent to monopolize the market.

A cartoon sat in Walker's office for most of the trial. It showed a small figure in a Superman suit labeled "F.W." standing atop a large building with a sign saying "Think IBM." The F.W. figure was pushing the "k" off "Think" to make the sign read "Thin IBM."

Perhaps it summed up his objective concisely.

Misleading Impression

But the interesting cast of characters in the case did not come only from the Telex side of the issue, with IBM and the court system serving up their share of personalities in the action.

The original district court judge for the case was called out of semiretirement in Utah to hear the matter. Judge A. Sherman Christensen, who was to become the first man ever to rule against IBM on a major matter in a courtroom, looks like everyone's kindly, fatherly uncle, more at home and in his element with his son-in-law on the trout stream than in the formal trappings of power that accompany a federal judge like a monk's habit.

But the impression is misleading, for while Christensen is certainly at home on the trout stream – and probably doesn't have to lie about the one who got away – he turned out to be one of the hardest workers in the case.

Not only did he force the lawyers to put in longer days in the courtroom than they were accustomed to, but he also did his homework, reading for as many as eight hours each night after adjournment in order to get through the plethora of documentary evidence introduced.

And he kept everyone working by badgering the parties to hammer out stipulations out of court and forcing them to cut out the nonessentials in their examinations of witnesses with threats of Saturday sessions.

Cast of Hundreds

On the IBM side, the cast numbered in the hundreds, but most were faceless, behind-the-scenes people: the top executives who, by design; did not say what they were thinking; the "bagmen" who shuttled into Tulsa with briefcases full of selected documents and internal notes, the special security guards who backed up the federal court guards in protecting the IBM rooms in the federal court building.

But the man out front was Thomas D. Barr, the trial lawyer handling the courtroom action in most of the cases against the firm. He personified the firm's defense.

Although originally a Midwesterner, Barr, with his bulldog look and attitude, has adopted the look, feel and inflection of the successful Eastern corporate lawyer so successfully that most people, not realizing his Missouri origins, would consider him a complete product of the Eastern preppie and Ivy League scene.

But, for the case, this image was played down; Barr even went so far as to adopt a pair of suspenders – usually bright red – to go with his banker's blue pinstripe suits. The "down-home" touch was seemingly designed to let the Westerners know he was, in reality, just a "good ole boy" in disguise.

But even with the disguise – for what it was worth – the meticulousness and precision that one learns to be successful in a big-time business law firm were not left at home. Backed up at first by F.A.O. Schwartz III (yes, of the toy store family and now chief counsel to the Senate committee investigating the Central Intelligence Agency in preparation for a life in politics), and then by David Boise, one of the brightest products of Yale in this generation even though he prefers to work in jeans and a sweatshirt, Barr prepared meticulously – and never stopped fighting the case.

And that may have been the secret. Even after the first defeat before Christensen in the district court, IBM never stopped trying. In fact, it tried harder.

Many have indicated the Telex effort in the appeals court seemed half-hearted – and it may well have been, with the firm feeling the case was in the bag.

But IBM put as much into the appeal as it had into the rest of the case – even rolling out ex-Attorney General Nicholas D. Katzenbach to make a presentation to the judges, several of whom were appointed while he was in the Justice Department.

And perhaps Katzenbach's professional approach to the case helped, for he seemed more to be leading a graduate seminar on the law than arguing a case. Not a flashy presentation, but effective.

And when those appeals court judges overturned the decision against IBM while upholding the decision against Telex on the trade secret charges, the long nightmare for the Telex executives began.

Faced with the question "Do we risk this entire company, our jobs and our stockholders' investments on the chance that the Supreme Court will hear the case and reverse the appeals court's decision?" they had to search their souls.

The risk was apparently too much, even for the gutsy men who obtained the first and possibly last judgment ever against IBM on antitrust grounds.

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CW 1015

Michigan Accepts Amdahl 470 After Tests Against 370

(Continued from Page 1)

There is, Alexander said, a good and valid separation of times charged to the supervisor and problem states "and that, of course, was vital to our evaluation of the Amdahl machine."

Another level of measurement was provided by the jobs subsystem of MTS which attempts to determine the characteristics of the workload on the machine and adjust certain parameters to optimize performance.

This subsystem watches CPU, paging, file I/O and total I/O measurements and, if any of these exceed preset limits, will attempt to reduce the load by inhibiting the startup of any batch jobs awaiting execution.

Two types of production jobs were selected for global timing comparisons, Emery explained. The first was a scientific calculation used in the determination of crystalline structures based on data obtained from X-ray diffraction experiments.

Identical calculations were performed on the 370/168 and the Amdahl 470. The programs "involved a significant portion of computational activity and relatively little I/O. The floating-point variables were all of short precision," the analyst noted.

The results showed the Amdahl machine with a better than 2 to 1 improvement – in terms of CPU seconds – over the IBM hardware.

The second production job – of a distinctly different nature – "revealed some interesting differences between the two machines," Emery went on.

This job was a literary search program written in Assembly language and containing no floating-point instructions. The search had three phases: the establishment of a data structure to represent the search parameters; a reading of the data and a comparison of its contents with the key data structure; and a report of the results.

Identical runs on the two machines indicated the Amdahl 470V/6 was only 1.25 times as fast as the 370. To investigate this "unexpected result," the search program was rerun under a time tally monitor which is part of MTS, Emery said.

The monitor showed 60% to 70% of CPU utilization occurred during the scanning of chains of data blocks and the comparison of keywords in the blocks with information read in from the bibliographic data tape.

More significantly, Emery noted, the monitor pinpointed a set of eight instructions that seemed to be critical.

Inspection of the monitor results from both machines showed the same relative amount of CPU time was spent executing the instructions in this loop. But closer study showed the 370 spending about equal time in both halves of the loop, whereas the Amdahl spent a "disproportionately large amount of time" performing the character comparison.

Further monitor runs confirmed the suspicion that the Execute instruction was the principal cause for the relatively slight speed improvement of the Amdahl overall, Emery said.

Modifying the loop to include a comparison on just the first few characters of each data chain, the program was run again on both machines.

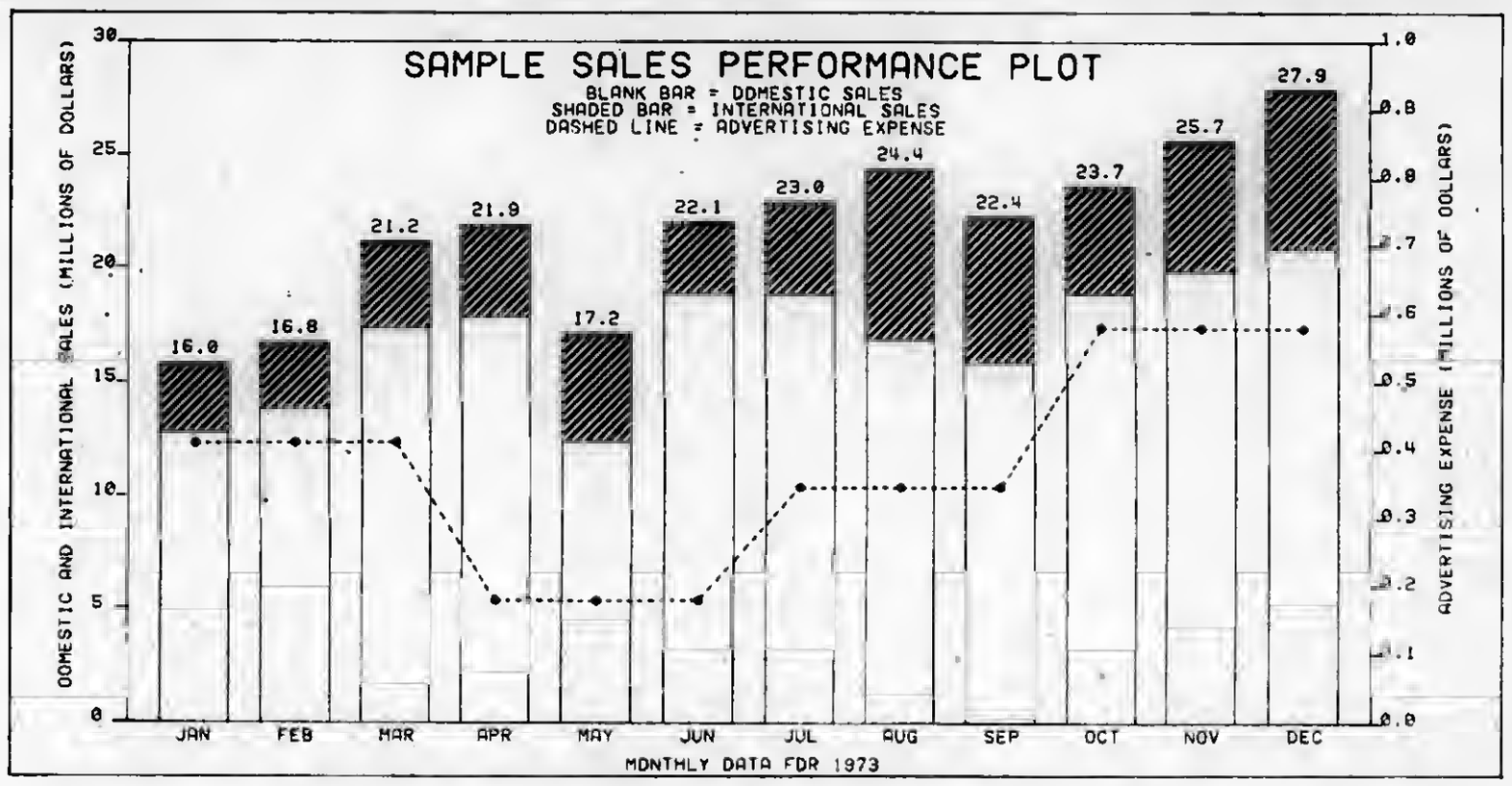
Monitor results and normal production timekeeping indicated the modified program required less time on both machines, but that the relative improvement was "significantly greater" on the 470V/6, Emery said.

With the changes in place, the Amdahl machine ran 1.7 times faster than the 370.

CPU TIME (Seconds)			
Activity	370/168	470V/6	Ratio
Structure Factor Computation	381.5	209.5	1.824
Least-Squares Refinement	431.9	191.4	2.257
Total	813.4	400.5	2.031

The results of the first production job – CPU utilization in the determination of the crystalline structure of myoglobin – run by the University of Michigan Computing Center to test the Amdahl 470V/6 against an IBM 370/168 showed the Amdahl machine with a better than 2 to 1 improvement over the IBM hardware.

This striking difference can be attributed almost entirely to the different implementation of the Execute instruction in the two machines, Emery said.



IBM Planning Attack On Antitrust Judge?

(Continued from Page 1)

pleasure with some of the judge's rulings on the procedures that are to be followed in conducting the case and on objections to government-introduced documents [CW, Oct. 1].

If the IBM filing last week charged the judge with misconduct, as some rumors seem to indicate, the firm may well ask for his removal from hearing the case or ask for a limit on some of his rulings.

If removal is sought, it could have far-reaching consequences for the rest of the massive antitrust trial, which is the largest action of its type ever tried in a federal district court.

In effect, hearings on such a matter could drag on for some time, diverting interest and time from the case at hand.

Additionally, if – and this would be an extremely remote possibility – Edelstein was removed from the case, it would take months for another judge to come up to speed on the issues, which could call for a relatively long recess.

That might delay resolution of the case until well after the presidential elections next year, when the climate for an out-of-court settlement could be more favorable than at present.

The exact charges in the matter will not be known until the appeals court lifts the veil of secrecy, which will certainly have to happen soon for hearings on the matter to be held.

But it is clear at this time that a new note of personal attack and bitterness has entered the case, which is already marred by charges of misconduct brought by lawyers on both sides of the case.

Those charges will be aired in open court, but the date for that hearing, which Edelstein indicated may affect the professional futures of the lawyers involved, has been postponed indefinitely at this time.

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Case Started in '72.

Telex-IBM Pact Leaves Trail of Litigation

By Edith Holmes
And Toni Wiseman
Of the CW Staff

Three years and seven months after the first motions were filed, The Telex vs. IBM antitrust case has finally been settled – out of court.

The following is a chronological review of the nearly four years of litigation which led to that settlement.

Feb. 2, 1972: Telex Corp. filed suit in the U.S. District Court in Tulsa, Okla., asking for the "dissolution of IBM as a single entity . . . monopolizing and controlling the EDP industry." The suit further asked damages amounting to about $877 million.

March 29, 1972: Telex updated its suit with a request for temporary and permanent injunctions barring IBM from offering extended-term leases to Telex customers and from renewing any of its fixed-term leases on their expiration.

IBM said the new charges were without merit and it would defend itself in court.

Aug. 2, 1972: Judge Philip Neville of the U.S. District Court for the District of Minnesota in St. Paul issued a temporary restraining order barring IBM from announcing a new product – the 370 series – to allow him time to hold a hearing on Sept. 1 on a Telex request that he issue a preliminary injunction barring the announcement.

The decision was reversed by the Eighth Circuit Court of Appeals in Omaha, Neb., on grounds that the order would have been in effect for more than 20 days, the maximum allowed under federal law.

Sept. 11, 1972: Neville heard Telex's motion for a preliminary injunction to prevent IBM from marketing its equipment on extended-term and fixed-term plans and IBM's motion for a summary judgment in the antitrust case.

Oct. 18, 1972: The Minnesota district court denied both IBM's motion for a summary judgment and Telex's motion for a preliminary injunction.

Jan. 17, 1973: The date of April 16 was set for the beginning of the Telex vs. IBM trial under the direction of Judge A. Sherman Christensen. Trial location was set for Tulsa, Okla.

Jan. 24, 1973: Telex asked the district court in St. Paul to set aside the out-of-court settlement made in an antitrust suit brought by Control Data Corp. against IBM because "CDC in conjunction with IBM . . . destroyed CDC's data base," thus preventing Telex from pursuing its suit with IBM.

Jan. 31, 1973: IBM sued Telex for misappropriation of IBM trade secrets and asked the court for $25 million in damages.

Historical Perspective

Feb. 7, 1973: IBM filed suit against Telex charging breach of a 1966 patent agreement and asking for payment to IBM of royalties due under the agreement.

Telex, meanwhile, claimed that suit was intended to divert attention from the antitrust case.

Feb. 21, 1973: The federal court in St. Paul denied Telex's motions to set aside part of the out-of-court settlement between CDC and IBM and also its move to hold IBM and CDC in contempt of court for destroying the index to the documents prepared by CDC.

April 11, 1973: Attorneys for IBM and Telex Corp. agreed to a nonjury trial.

April 16, 1973: Telex vs. IBM went to trial.

June 16, 1973: All testimony in the antitrust case between Telex and IBM had been heard by this date and oral summations of the arguments began.

Christensen decided not to issue a temporary judgment immediately after the conclusion of the arguments both because of the complexities of the case and to prevent any trading on the stock of either company by the courtroom attendees.

July 25, 1973: Telex requested that IBM pay $1.3 million in legal fees if it was found guilty of the antitrust charges. Final figures requested by Telex amounted to $1.08 billion.

IBM raised its claim from $25 million to $48 million on the countersuit it filed against Telex.

Sept. 17, 1973: Christensen found IBM guilty of monopolization of the plug-compatible peripherals market and Telex guilty of the charge of misappropriating trade secrets.

IBM was fined $325.5 million and Telex was ordered to pay over $21.9 million.

The decision prohibited IBM from offering "bundled" memories with 370 CPUs and ordered IBM to separately price CPUs and memories within 60 days.

In addition, IBM complied with one of the provisions in Christensen's decision by suspending collection of penalty charges under the fixed-term, extended-term and long-term lease plans.

At the same time, IBM also said that, if a higher court later reversed the district court ruling, IBM would collect those charges retroactively.

IBM was also "enjoined from adopting, implementing or carrying out predatory pricing, leasing or other acts, practices or strategies with intent to obtain or maintain a monopoly" in the peripherals area.

Sept. 27, 1973: IBM and Telex filed motions seeking to amend the judgments made against each of them by the district court.

Telex also requested Christensen to set the trial date for the case the peripherals manufacturer wanted to bring against IBM on monopolization in the international market.

Oct. 10, 1973: Christensen admitted his computation of the antitrust damages against IBM involved substantial error. He set a new hearing date for consideration of the fines.

Oct. 16, 1973: Christensen set aside the $325.5 million judgment in Telex's favor.

Nov. 9, 1973: The damages to be paid by IBM were reduced by the court. IBM was ordered to pay $259.5 million, three times the actual damages of $86.5 million found for its domination of the plug-compatible market.

IBM's appeal of the antitrust case went to the 10th Circuit Court of Appeals in Denver. The definition of predatory pricing became crucial to both parties in the case.

May 14, 1974: IBM and Telex completed deliveries of the now-familiar arguments in the case before the appeals court. A decision on the case was expected by all momentarily . . .

(Continued on Page 7)

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Legal, Technical Efforts Required to Stop DP Crime

By Edward J. Bride
Of the CW Staff

ITASCA, Ill. – While-collar crime is a "joint problem" which must be solved by both the legal and technical communities, especlally since many major financial crimes are now aided by computer technology, the attorney general of the state of Illinois said here recently.

In the keynote address to the annual conference of the Association of Computer Programmers and Analysts (Acpa), William J. Scott said he is "not sure we can stay ahead of the criminals" in developing "effective defenses against computerized financial crime."

"We must put our heads – and machines – together," he told attendees.

"We must draw on the specialized knowledge in our two fields of endeavor to counteract a cancer growing within our society," Scott said, adding the "cancer" of white-collar crime is "often undetected and, even when the discovery is made, there is frequently no adequate treatment yet available."

Law Too Lenient?

The maximum penalty for financial crime in Illinois is one to three years, even though damages can run into the billions and "wipe out the life savings" of many individuals, Scott said.

More than $2 billion worth of bogus insurance policies were created for Equity Funding Life Insurance Co. of Elmhurst, Ill., Scott recalled, with a subsequent "run-up of the stock of the insurance company's parent, Equity Funding Corp. of America."

Pensions, profit sharing and annuities depend on the safety of assets which are invested largely in securities, Scott said. If those securities turn out to be phony, as they did with Equity Funding, then "what relief will there ever be for the elderly people whose retirement is cruelly undermined?"

The Equity Funding caper "showed how far [criminals] can get, even without full utilization of computers," Scott said.

A Pencil Fraud

Although the Equity Funding situation existed for about nine years, Scott continued, the trustee in bankruptcy has now concluded the scheme was "actually quite unsophisticated in both design and execution."

It was "essentially a pencil fraud, perpetrated by bogus manual accounting entries," with no support for the rapidly mounting earnings figures the company was reporting. "Better auditing would have detected this," Scott said.

The trustee concluded the conspirators' "helter-skelter, hand-to-mouth efforts demonstrated a striking lack of analytical insight and forethought," Scott said.

The trustee has also debunked Equity Funding as a computer fraud, he continued. Although the conspirators generated "reams of printouts of insurance policy record to support the fraud," there was little or no underiying detail created for these printouts, Scott said.

In fact, the conspirators "didn't even rely on their own printouts" when it came to making accounting entries. They "brazenly recorded fictitious income figures simply by writing them in," he said.

Scott quoted from the trustee's reports: "While the computer may have generated a paper 'screen' for some aspects of the fraud, in fact, the role it played was no bigger or more complicated than that played by the company's adding machines."

All this has caused him to talk and to worry about "massive computerized crimes that could have truly cataclysmic consequences for individuals, businesses, banks and indeed our nation's entire economic and social fabric," Scott said.

Hope in Pooled Talents

"We lawyers cannot cope" with the problem alone, "nor can computer experts," Scott said, adding "our only hope is to pool our talents."

He also quoted from a Justice Department report on white-collar crime, which said that, while much is known about controlling, auditing and monitoring most people, "we have only the most elementary knowledge of how to audit computers and those who have learned how to use them.

"The search for control procedures is complicated by the accelerating rate at which thc computer art is developing, a rate which makes controls obsolete almost as quickly as they are developed.

"Existing control methodology is not adequate for internal control or for investigating agencies or for regulation by regulatory agencies," the report noted.

An "inadequate remedy for the potentially prodigious wrongs of computerized financial crimes will leave our nation, our fellow citizens and indeed our own families and friends subject to chicanery that could truly shake the foundations of America," Scott said.

Litigation Trails Telex-IBM Pact

(Continued from Page 6)

Jan. 24, 1975: The Denver appeals court reversed the decision of the lower court on the basis of the arguments in IBM's counterclaim.

Telex was fined $18.5 million in compensatory and punitive damages on the theft of trade secrets charge.

In its decision, the appeals court said that Christensen, who made the original award to Telex, erred in his definition of the market and that IBM practices were just competitive, not predatory.

March 5, 1975: Claiming the appeals court erred in defining the relevant product market, Telex filed for a rehearing of its antitrust suit against IBM.

April 9, 1975: The 10th Circuit Court of Appeals denied Telex's petition for a rehearing.

June 11, 1975: Telex filed an appeal of its antitrust suit against IBM with the Supreme Court.

Oct. 3, 1975: Telex withdrew its appeal to the Supreme Court in exchange for release by IBM from the $18.5 million judgment against Telex for theft of IBM trade secrets. No monetary payments by either side were involved in the settlement.

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Management Problems Promoting Women Self-Imposed

By Molly Upton
Of the CW Staff

SAN FRANCISCO – "Seek and ye shall find women qualified for management positions" was one of the messages from a session on "Promoting Women? What's the Problem?" at a recent conference here.

Solutions to the problems of promoting women lie within the realm of both management and the employee, panelists told over 100 attendees, of whom nearly half were men.

Lack of objectivity in evaluating qualified people, stereotyping and failing to try to find qualified individuals are some of the obstacles to promoting women that management imposes on itself, panelists agreed.

In addition to the blockades presented by management, employees face the problems of overcoming covert discrimination, conditioning of various forms and lack of visibility, they said.

Promoting women is "no game for cowards," Esther Williams, a specialist in metallurgy at Lockheed Missiles and Space Co., said.

"For a long time to come, the person helping promote women will have problems, but it's worth it," she said.

These executives are apt to have their decision subject to ribald comments and innuendos, Williams said, adding "it takes a really big executive to take the responsibility."

Management often lacks the objectivity to evaluate qualified people, she said: "If you look, you could find unrecognized talents."

"When reading a resume, don't look at the name," Carolyn Morris, customer engineer manager for the 2000 series at Hewlett-Packard (HP) Co., suggested. "Somehow the E.E. or the M.B.A. degree doesn't look quite as good when it belongs to a woman."

"The real failure is the failure to try" to find qualified individuals, Jean Wright, compliance officer with the Department of Defense, said. The top-down approach works well, she observed.

In firms where the top manager has told department managers their performance review will include an evaluation of how well they have complied with equal opportunity guidelines, they succeed in finding qualified women, she explained.

Wright agreed the lack of visibility is a real problem. "Often management forgot qualified women were there. They were scratched before the race started," she said.

Although management is known to plead that there is a lack of women with the needed technical skills, the job requirement should be examined in depth to assess how much recent technical experience is really necessary, Williams said.

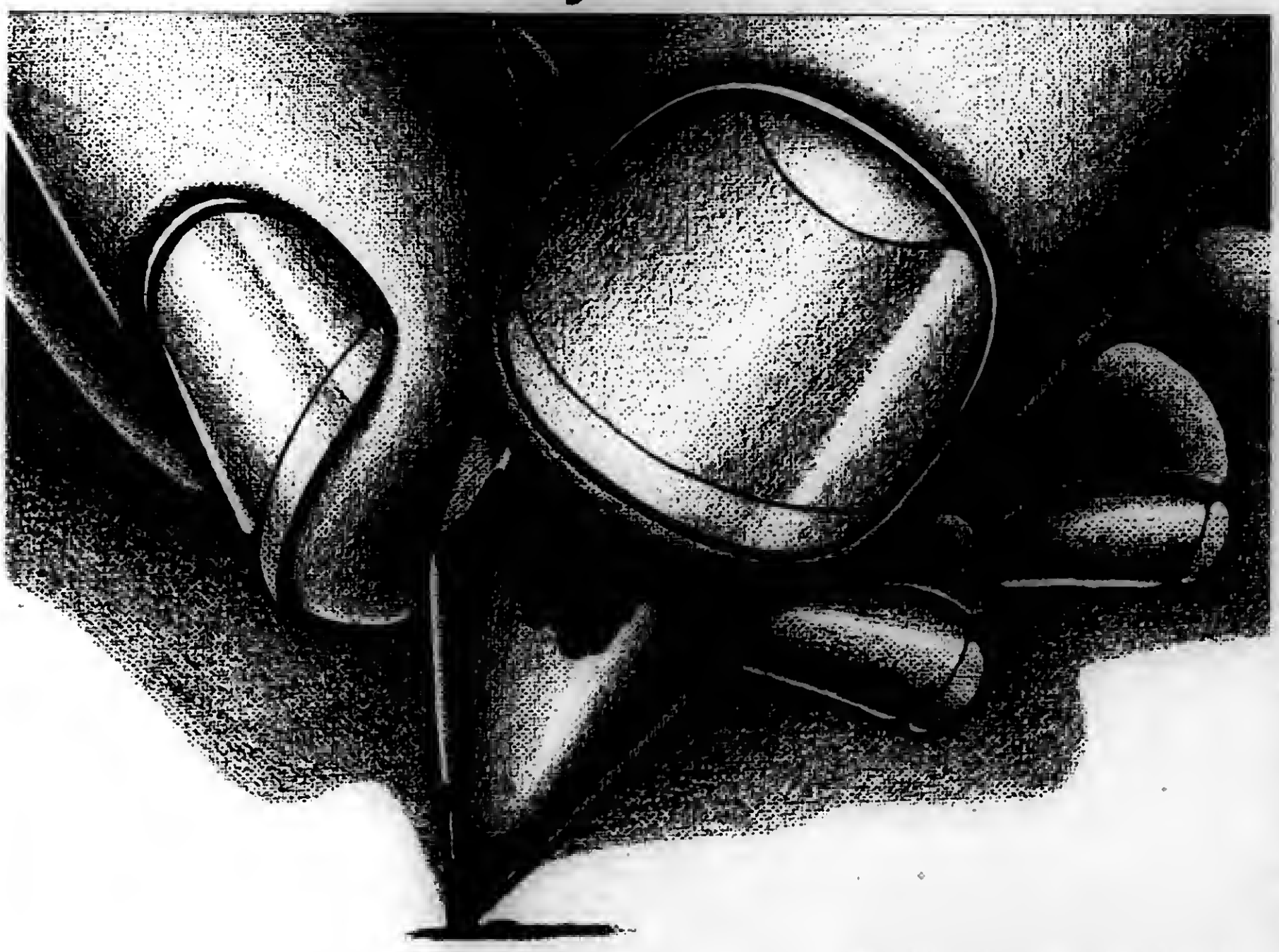
To augment the number of women considered qualified in technical fields, Wright suggested firms institute a "cadet" program, hiring high school boys and girls equally for part-time jobs.

Companies could put more women into their training programs. This gives the firm a chance to evaluate not only their qualifications for the job, but their ability to cope with "the unequal problem of being a woman," Williams said.

Companies must assume a more active role in helping women advance, Jim Harper, human resources manager at Tektronix, Inc., warned. A company not taking this responsibility may lose its people to a neighboring firm, he said.

"One of the most devastating stereotypes for women is that of "temporary" employee, Williams said. She refuted this image with statistics from the Department of Labor showing the average length of service by women is comparable to that of men.

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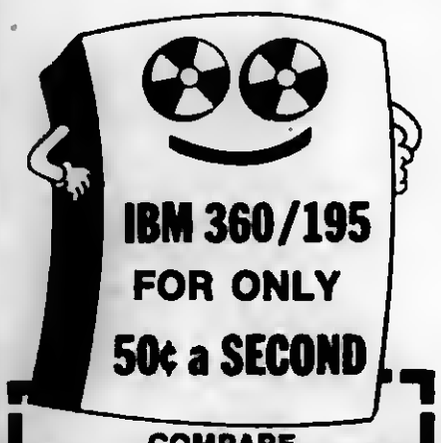
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In Legislative Hearings

Corporate Positions on Privacy Missing

By Edward J. Bride
Of the CW Staff

ITASCA, Ill. – Representatives of business are often "unable to state a corporate position" on the use of computerized files when called to testify in front of Federal or state government committees looking into privacy legislation, a state legislator claimed here recently.

In a speech before the national conference of the Association of Computer Programmers and Analysts (Acpa), Illinois state senator David J. Regner (R-Mt. Prospect) said the Illinois General Assembly considered five privacy bills during the past session.

While none has passed yet, these five "represent only the beginning of individual efforts," he predicted.

"In many of the public hearings," Regner said, witnesses could not state corporate positions "because of conflicts within their organizations. Other organizations would testify, but the impact of proposals could not be quantified.

"The lack of information about our information systems was considerable," Regner, the chairman of the Illinois Senate's Legislative Information Systems Committee, said.

Company management needs input from technicians, he said, because "in most instances, management does not know the extent of the gathering, use, or dissemination of personal information in its organization."

Furthermore, Regner indicated management often does not know "what controls are currently utilized to prevent loss or injury to its data bases" and does not know "the administrative procedure necessary to allow access to data."

'Serious Abridgment'

Despite all this, Regner referred to the Justice Department's requirement for dedicated law-enforcement computers at the state and local level as "a serious abridgment of states' rights.

"It has been estimated these rules will cost the State of Illinois $50 million, excluding local governments," Regner commented.

If the rules are allowed to stand, there is the "danger" of precedent, with other federal agencies possibly requiring dedicated systems if local or state governments wish to participate in other federally funded programs, he said.

"State and local governments cannot afford to fragment their data processing into many small dedicated shops," Regner said.

Instead of executive regulation, such as the Justice Department policy, Regner said he prefers legislation as an aid in protecting individual privacy: "Though legislation cannot do everything, legislation is the best method of assuring individual privacy without creating an environment of exorbitant costs."

CW At Acpa

Safe Action Plan

To aid DP management in identifying the potential weaknesses of DP systems, Regner called attention to the Secure Automated Facility Environment (Safe) project in Illinois, part of the overall IBM security project.

(Continued on Page 11)

More Legislation Predicted

ITASCA, Ill. – The current interest in personal privacy will probably lead to legislation on criminal justice information systems and individual taxpayer privacy, according to the acting director of the President's Domestic Council Committee on the Right of Privacy.

George B. Trubow also said "tremendous behavioral analysis" is possible with the imminence of point-of-sale funds transfer systems.

There are "awesome potentials" but also "tremendous advantages," he told about 100 attendees at the annual conference of the Association of Computer Programmers and Analysts (Acpa).

Claiming the "checkless, cashless society is coming right down the pike, and computer people are right in the middle of it," Trubow also said the issues of personal privacy are "manageable."

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But Agreement Ends There

Test of DP Knowledge Seen Necessary

By Edward J. Bride
Of the CW Staff

ITASCA, Ill. – Divergent opinions on the licensing issue were heard at a session of the fifth annual conference of the Association of Computer Programmers and Analysts (Acpa) here recently.

About the only issue on which there was agreement was the need to establish an accepted and acceptable test to measure "acquired knowledge," as opposed to competence, which cannot be measured.

Currently, the Certificate in Data Processing (CDP) is the most widely accepted document for such measurement, but



Casper



Rudland

only a small minority of DPers are CDP holders.

Licensing at some point in the future may be desirable, but is "premature" today, Fred H. Harris of the Insitute for the Certification of Computer Professionals said.

However, "we are ready for licensing," according to Sam Rudland, executive vice-president of the Florida Society of Certified Data Processors (FSCDP).

FSCDP was chartered expressly to push for state-level licensing, and the bill which the group caused to be introduced into the state legislature will probably undergo committee hearings starting this week, Rudland said.

Voluntary licensing won't work since politicians don't like to support "small groups of voters," Rudland said. And regulatory boards are "inflationary . . . they seldom pay their own way," he continued.

Noting that much of the licensing controversy surrounds the privacy issue, he said industry cannot use media such as the *Federal Register* to promulgate the existence and types of data bases, leading to increased costs in the private sector.

Uniform Codes Needed

Aligned somewhat with Rudland was Dr. Gary Casper, a board member of the national Society of Certified Data Processors (SCDP).

While Casper feels the chief issue is the formation of a "legitimate profession, regulated to protect the public interest" and give the profession tools for improvement, he said licensing is indeed premature until uniform codes of practices are established.

He proposed cooperative workshops among the various societies to set such a uniform code. Then, the process of licensing could "establish immediate legitimacy" for the profession and lead to improved standards, Casper said.

"Licensing is far from dead, and we will continue until it becomes fact," he said.

The concept of regulation is probably accepted by computer people today; the divergence is on the form of regulation, i.e., by peers (voluntary certification and/or licensing), by employers or by law, Casper said.

Regarding all the public meetings and press coverage on the issue, Casper asked: "How could so much discourse in the past year have produced so little and convinced so few?"

The plethora of letters to various trade publications is evidence the issue is no longer considered trivial, he said.

Martin A. Morris, a board member of Acpa and chairman of the conference, said neither a license nor a certificate can guarantee "successful, competent or ethical performance."

CW At Acpa

The time has come "to call a moratorium on the rhetoric" and to "start to do something constructive for our industry," Morris said. He agreed with other speakers "the industry needs a set of commonly accepted practices."

Sitting for the CDP exam is a "personal ego trip" for some people, Morris said.

The CDP "has made me aware . . . that as a processor of information, I potentially control an awesome weapon of destruction, if used in an improper manner," he said.

Although many people believe the licensing controversy and renewed interest in the CDP is due to concern over the privacy issue, Morris called certification for him "a self-discipline."

'Ugly Stigma'

Certification procedures "should be controlled by representative professional groups within the discipline in question and never by a governmental body," he said.

Once the government gets involved,



Morris

Harris

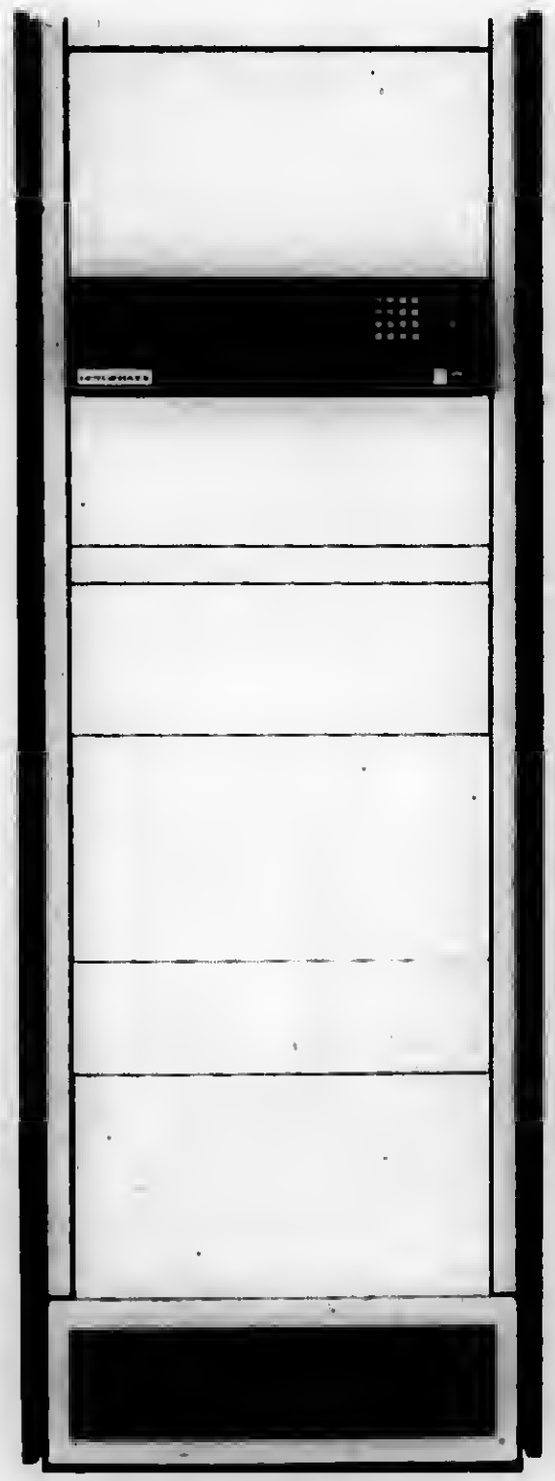
Acpa photos by J. Brown

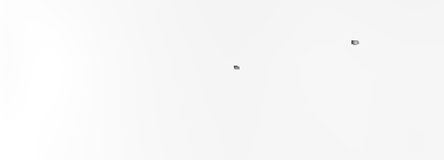
"the quest for true professional recognition passes into oblivion, never more to return, and the ugly stigma of licensing becomes branded on that occupation," Morris said.

The stigma is "ugly" because licensing has traditionally "served to shut the entrance doors to many occupations, while providing little, if any, professional recognition for the individual license holder."

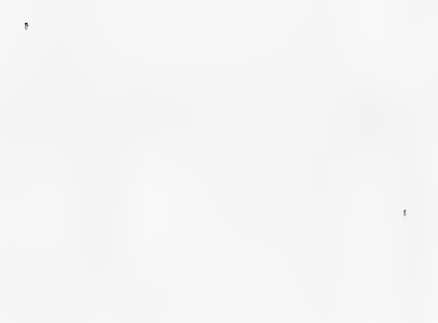
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Formal Career Pathing 'Essential' to Management

By Edward J. Bride
Of the CW Staff

ITASCA, Ill. – Aside from the psychological and occupational benefits provided to technicians by formal career-pathing procedures, a DP career program is "essential" if "management is to carry out its mission with efficiency and to work through people."

This was the message presented to attendees at the annual conference of the Association of Computer Programmers and Analysts (Acpa) here recently by David R. Skeen, DP director at the Office of Naval Research.

It is "painfully clear" computer people "do not have a clear overall view of their vocation" and management "has not identified and implemented a program for them to use as a guide," Skeen said.

In this age of high technological sophistication, it should be "almost self-evident that such action should be undertaken," he said.

The Federal ADP Users Group has spent nearly four years identifying a career structure and corollary steps for a career development program, he noted. The group has, in fact, formed a special interest group on career development to design a structure that can become "a standard in the computer industry" as well as provide a "foundation for identifying criteria for future certification," Skeen reported.

CW At Acpa

Skeen was but one of many speakers to touch on the certification issue, with most of them agreeing on the need to measure acquired knowledge (see story on Page 10). Nearly all who mentioned certification also expressed frustration at the failure of the Certificate in Data Processing (CDP) to achieve industry respect and acceptance.

Defining a base of knowledge "is the key to any certification program," Skeen commented, since "this presupposes identification of a position structure, a systems life cycle for DP projects, skills and training criteria necessary to support such a base."

But certification is not the only goal of this approach. "The prime objective of management," he said, "is to carry out its mission with efficiency and to work through people," and a formal program for career pathing is "essential to this end."

Within any organization, the major steps necessary to develop a career development program would, he said, require the following:

- Identifying tasks in a "systems life cycle matrix."
- Developing an organizational framework, beginning with career groups which specifically identify career ladders.
- Developing position descriptions,



Acpa Photo by J. Brown
David R. Skeen

which requires "listing the knowledge and skills necessary for performing at each designated level."
- Setting forth the criteria for performance, e.g., training, experience, testing and proficiency.
- Implementing the career development model "by first inventorying those skills which presently exist in the organization."
- Evaluating and continually updating the program.

The first four steps – task identification, framework, position descriptions and performance criteria – are "the foundation upon which certification is built," Skeen continued.

These "must be accepted by the computer industry in general if certification is to provide meaning to its participants."

Corporate Positions On Privacy Missing

(Continued from Page 9)

Safe came up with a 10-step action plan that can be used by the general DP community, and Regner outlined these steps as follows:

- One: Review information system requirements. (What data is being collected and why is it needed?)
- Two: Analyze confidentiality and criticality of information. (What are the legal, social and corporate responsibilities regarding information privacy and security?)
- Three: Assess vulnerabilities and risks. (What specific vulnerabilities confront the organization's information systems and resources?)
- Four: Investigate technological safeguards. (What technological safeguards are presently being used by the organization and others?)
- Five: Budget for information privacy. (What are the costs involved in the implementation and operation of a security and privacy program?)
- Six: Organize for information privacy. (Will a new organization be required or can the objectives be achieved within the existing organization?)
- Seven: Establish individual accountability. (Who has the need to know and to change and the right to expunge information?)
- Eight: Implement technological safeguards. (What is the priority of the information privacy and security objective compared to other organizational objectives?)
- Nine: Create a privacy- and security-conscious environment. (Is the organizational objective supported with procedures, policies, practices and education?)
- Ten: Audit. (What improvements can be made to make security more efficient and effective?)

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Editorials

No Resolution

The decision of Telex Corp. not to pursue its antitrust suit against IBM is at once both understandable and regrettable.

The decision is understandable because pursuing the case would have essentially meant betting the future of the company on whether the Supreme Court would choose to listen to the Telex arguments.

It is clear IBM would have immediately called for Telex to pay the $18.5 million Telex would have owed IBM if the Supreme Court had decided not to hear the case.

Clearly, Telex, even though marginally profitable, could not have afforded to make such a large payment in one lump sum. Therefore, the Supreme Court's decision not to hear the case would have meant instant bankruptcy for Telex.

The firm, which has been the most aggressive to date in its pursuit of antitrust matters against IBM, obviously felt it could not risk all for the chance to gain a place on this year's Supreme Court calendar, which promises to be one of the busiest in years.

The firm's bankers probably had some influence in the decision, whether that influence was clearly stated or just implied, since bankers usually worry more about the possibilities of loan repayments than about abstract justice or long-shot gambles. But the decision is regrettable since it leaves all of the issues raised by the Telex case unresolved.

There were clear and sharp differences between the district court and the appeals court over the case, and those differences could be resolved only by a final determination on the part of the Supreme Court.

That determination is now impossible and everyone in the computer community loses because of it.

The producers of equipment lose because the final groundrules for their operations in the computer field are not clearly outlined – and that goes for IBM as much as for the producers of independent equipment and other mainframe makers.

Users lose because the future of the independent peripherals business is not clear and will not be until some of the other suits now pending against IBM are tried and finally resolved – a process that will take years.

The public loses because an important issue in antitrust law and policy has been left unresolved by the highest court in the land.

Telex should have pursued the case to its ultimate resolution, but the ante was just too high. While we understand, we regret the decision.

Where Was the Government?

One of the mysteries of the entire Telex Corp. appeal to the Supreme Court revolves around the lack of action by the U.S. government in the case.

Since the government is trying IBM on some of the same grounds as Telex did, it would have seemed logical if the government had filed a "friend of the court" brief with the Supreme Court asking it to take up the Telex appeal.

But it did not, and there is some feeling this lack of support on the part of the government helped lead Telex to its decision to withdraw the appeal at the last minute.

Clearly, whether or not the government support would have bolstered the courage of the Telex officers, the government should have acted.

The reasons behind its decision not to act will apparently be one of the unresolved mysteries of the case for a long time to come.



'Entwhistle's Department Is Responsible for Correcting the 25% of Cases With Erroneous Overpayments, and Cadwallader's Department Is Responsible for Correcting the 15% of Those That Still Need Correction."

Letters to the Editor

Privacy Can't Be Legislated; HEW Management Decision Sound

The editorial in the Oct. 1 *Computerworld*, "A Sad Commentary," is sad indeed in that it implies "privacy" can and should be explicitly legislated, and it calls what appears to be a sound Department of Health, Education and Welfare (HEW) top-management decision "ramming its way through the opening in the law."

I say an orchid to the Office of Management and Budget (OMB) for its excellent set of guidelines, which recognizes the rights of the heads of superagencies as well as smaller organizational entities.

If CW's line of reasoning, instead of OMB's, were followed in the private sector, if and when privacy legislation applies, organizational entities of a diversified corporation having vastly different functions could be forced out of business.

I hope HEW's decision "to provide tighter controls by centralizing and maintaining that control at the secretary's level" is not subverted by its 11 subunits, is highly successful and becomes a federal standard of sorts.

Charles E. Emswiler

Richmond, Va.

Background on DBMS Incomplete

The essential point in the article, "IMS Works for University After DBMS 'Rules' Bent," [CW, Oct. 1] was properly made that IBM's IMS has been successful for us as a data base management system (DBMS); however, the background was oversimplified and incomplete as written.

First, in selecting a DBMS, we chose not to conduct an exhaustive in-house testing process, but rather to utilize a team of our most experienced personnel led by the director of the data systems center and the manager of systems programming.

The most important factor in a DBMS selection is an understanding of the data which will be stored and the potential uses of that data. Our intent was to review all relevant information concerning software being offered as well as communications with system users when appropriate.

Our analysis was concerned with the usability, sophistication, security, support utilities, reliability, balanced data base and communication facilities and potential enhancements.

While many systems have valuable features, we felt the IMS product most closely suited both our current and long-range requirements.

A second very important point must be made concerning the function of a data base administrator (DBA). We do, in fact, acknowledge the importance of such a concept; however, during the initial stages of a DBMS development, we have chosen to draw on the in-depth knowledge our experienced analysts have concerning the information processing requirements of the university.

We have been evolving the function of a DBA over the past two years by first establishing a systems coordinator function which, through the utilization of structured walkthroughs and design workshops, maintains, encourages and guides the integration of development activities and is responsible for overall system performance and integrity.

As the systems become more extensive and complex, the function becomes more structured and formalized along the lines of a classical data base administration function.

Finally, any so-called DBMS "rules" should, in fact, be bent or broken if, after careful analysis, such action will result in the most effective DBMS for the organization and environment involved.

With the early availability of a comprehensive data dictionary system and active participation of our customers through a specialized task team structure, we have avoided having the technology dictate the development.

Instead, we have the horse before the cart in developing information systems first, which then utilize DBMS facilities to provide a more valuable resource than would be possible from concentrating on the technology to be used.

Gary L. Shaw
Manager, Student Data Systems
University of Michigan
Ann Arbor, Mich.

CW Has Duty to Inform Users

I am surprised at Gerald L. Bortle's letter [CW, Oct. 1] with respect to the announcements and policies recently established by Honeywell.

It is quite evident Bortle is either an employee of Honeywell or has a very poor understanding of the impact Honeywell's new policies have on the Honeywell user, the values of the system and its own vendor independence.

It is, further, obvious he does not comprehend *Computerworld*'s obligation to inform DP users of any and all critical activities either announced or carried out by the vendors of DP equipment.

John F. Allen

Sausalito, Calif.

Where's Computer Angle?

Thomas Mooshammer is a very funny man. He preaches determinism for women and free will for men. He seems also to think [CW, Oct. 1] that women have better sex lives than men.

But what has that got to do with computers?

David Ames

Watertown, Mass.

Letters to the Editor

Grosch Right: NCR Never Entered DP Mart

In the past several months Herb Grosch's comments on NCR and Xerox have prompted indignant letters from such luminaries as William S. Anderson (of NCR) and Jim Buren (of Houston, Texas). His foresight has prevailed, as Xerox indeed closed down its computer operations.

Now we of the DP staff at School District No. 205 in Harvey, Ill., announce, "As far as we're concerned, NCR never really entered the computer field." So you see, Grosch was right all the time.

We have had a Century 200 for more than two years. Since the computer was installed, we have had every problem imaginable.

Some days were worse than others, and to cite examples: (1) the service rep lost both of his diagnostic disk packs lo head crashes on different drives within the same half-hour period; (2) within 15 minutes, the punch unit, console typewriter and printer went down.

The printer actually went up in smoke and was down for the better part of four days. During lhis time it would shut itself off and later come back up, to the disbelief of the service rep.

Also, both card readers would quit (we have two just to be safe) at the same time.

The above are the heavier problems, to bc fair about it. Smaller versions of these have occurred regularly since we replaced our 1401. The longest we have ever gone without making a service call is two weeks.

We are firmly convinced NCR should stay with cash registers . . .

Ed Tunstall
DP Manager
Thornton Township High Schools
Harvey, Ill.

Arrogant Attitude

Here is another example of poor systems design resulting in inflexibility in changing a billing date, similar to those incidents mentioned in the Taylor Report recently.

The credit manager at Famous-Barr (one of the largest department stores in St. Louis) informed me that the store bills strictly on the basis of last name and that it is impossible to change my billing date without changing my name.

How do I proceed from here? How can an individual bring pressure to change this arrogant attitude? A program change can be made, but only if the company wants to make one.

Naturally, I plan to get around it by not shopping at that store in the future, but, again, who cares?

Keep pounding away at this unprofessional approach (of course first management has to authorize a policy change) toward system design.

As long as this lype of altitude prevails, we in the industry should shelve talk about professionalism.

W. Robert Walker
St. Louis, Mo.

Good Government

I recently received a review of 1974 EDP activities in the Canadian government and was very much impressed by both the completeness and the conciseness of the document. It refers to experiences dating back to 1961 – punched-card days – and goes two fiscal years into the future. There is no comparable document for the American federal scene; no plans are afoot, as far as I know, to produce one; indeed, the huge effort required would really be wasted, since Washington (unlike Ottawa) has no mechanism to control EDP expenditures or personnel practices even if it had an accurate report of past situations. We were too early – and are too big, and too messy.

Canadian EDP costs rose 21% per year from 1961 through 1967, when unit record equipment was being replaced by computers, and then by 27% annually through 1973 as new computerized projects were activated. Present plans envisage a growth of only 20% for the immediate future, but the Treasury Board cautions that predictions in the past have proved conservative.

Total costs are running about $225 million annually: 43% salaries, 34% equipment, 4% supplies (total direct costs hence being 81%), and 19% indirect (benefits, travel, and so on). This is probably about one-twentieth of the U.S. federal figure; no one knows within a faclor of 1.5, maybe even 2.0.

Computer services are 50% batch, 35% remote batch, 8% time-sharing, 2% text editing. Other machine-based services (punched card, OCR, COM, etc.) run about one-half the computcr amount – that is, about $50 million per year as against $100 million – systems and programming is $60 million, and training supplied outside the shop, $1 million or so.

Thc departmental organization in the Canadian central government is somewhat different from the U.S.; National Defence accounts for only 15%, Supply and Services (sort of like our GSA, but running many service-bureau-like computer operations as well as much procurement) is 12%, the tax boys about the same, and the RCMP (the Mounties) about 9% – much more than our FBI, while Defence is much less than ours.

On a cost basis, IBM has 60%, Univac and Honeywell 9 each, Burroughs 7, DEC almost 5, and Control Data 3. Of the small computers, DEC accounts for 52% in dollar terms, followed by Hewlett-Packard with 14, Data General with 9, and Interdata with 7. But as in the U.S., the big babies account for most of the expenditure: almost 97%, in the Canadian case.

Normally I don't do a straight reporting story like this, or at least not in this column. But it seems to me we have here very complete and accurate figures for a major North American user, not all wopper-jawed like Washington (whose data we don't have anyway, and couldn't trust). Arguments like the age-old ones about hardware cost trends, in-house versus extcrnal facilities, types of service ulilized, all are more useful if based on current, unprejudiced facts. The Canadians have supplied us a very nice sel.



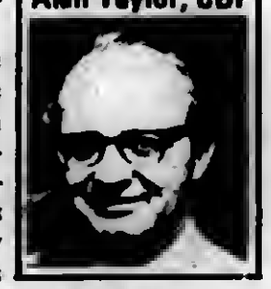
Herb Grosch

Prospects Improving for Nonprogrammer Programming

The possibility of "nonprogrammer programming" spreading outside the restricted field of interactive queries has increased recently, both as a result of 1975 hardware and software successes and of new discoveries as to how data is used.

What the impact of everything put together will be by 1980 is anybody's guess, but the work is now being pushed both by universities and computer vendors, so something is certainly going to happen.

The Taylor Report
By
Alan Taylor, CDP



From a hardware standpoint, the successes have been based on the development of automatic tape libraries using high-density packing of data. This dates back some years, and both events were covered here at the time of their development.

They have since become an active market product, now referred to as the "flexibles" to permit the inclusion of later products such as the honeycombs of the IBM 3850 as well as the Xytex (now California Computer Products, Inc.), Ampex Corp. and Control Data Corp. systems.

In the new nonprogrammer programming mode, instead of simply handling current dala processing systems on a faster basis, tbese expandable data libraries are used to hold generous-sized data bases of files, whose organization and whereabouts is handled only by the system and not by any programmer.

Thus a file may be held only in the flexible library (thus making it unavailable for a minute or two) or may be promoted by lhc data base system to some form of disk with a hundred times faster access.

Even newer hardware such as the electronic or bubble memories are expected soon to provide another staging position between the proccssing main memory and the disk-type storage with which we are currently familiar. This will leave us with a four-stage hierarchy of memories with no operator involvement.

Software and Snow White

Software for handling these file movements and the automatic selection of required parts of the files for actual processing has also been progressing fast under the general area of query languages.

The most successful techniques at present bear the forbidding name of "relational data base" languages.

Under these systems, programming required for some specific application starts only after the question (or instruction) is given.

The programming is handled automatically in a generation of automatic programming that far surpasses the 1960 Cobol-type level of automatic programming, while having none of the rigidity associated with 1970's packaged applications of today's computer users.

The basic simplicity of the nonprogrammer programming approach can be seen by taking the old Snow White fairy story question and imagining how the queen's information system would have handled her imperious demand, "Mirror, mirror on the wall, who is fairest of them all?"

Clearly, the first word, mirror, is addressed to a lerminal dcvice with some audio capability. All this does is activate the system, get approval of the passwords and security, etc.

The second group, mirror on the wall, defines the output terminal to be used – in this case a soft-copy operation because the queen didn't want to have unnecessary documentation around if anything went wrong.

With the system alerted and the output terminal defined, it is ready to look for the actual instructions as to what has to be programmed. The instruction comes: "Who is fairest of them all?."

As soon as this instruction is received, the queen's information system has received enough data to program itself to start its task. It has its order to:

- Find a file called "all."
- Extract the record descriptions held in the all file and use tbc system dictionary to find if any field or field combination can be compared in terms of "fairness." Suitable fields would be "judicial temperment," "skin color," ranking in Miss America Contest," etc.
- Scan all entries in the all file, comparing the fields chosen, and determine for each field the "fairest" individual lisled.
- If more or less than one individual name results, invoke an ambiguity routine.
- If one and only one name is produced, obtain the salutations appropriate for the terminal "mirror on the wall," format the name produced into it and display it on mirror on the wall.

Now, look at that again. Is there anything there that cannot be handled in a minute or two, provided there are no operational problems in getting at the "all" file? There just aren't any insolvable logical problems, and so the queen's query can be handled without it ever being touched by a programmer. And, logically, so could a monthly sales report.

Efficiency a Must

However, simply to be able to handle problems such as these without having direct programming, of course, does not mean they will be handled that way. It must also be economically worthwhile to do so.

The fact is information needs are much more "clustered" together lhan had been suspected, which means the efficiency of easy algorithms about where to keep various files will be unexpectedly fruitful.

For instance, in August, a University of California researcher, R.D. Hackthorn, was watching the frequency with which the same record was extracted twice or more during a single day in a California county system.

The expected average hit rate was expected to be about 1.1. That is, it was expected there would be 11 or 12 accesses to any 10 records that were accessed during the day.

The rate was found to be about 2.0. That's a complete order-of-magnitude improvement over what was expected, and orders of magnitude improvements are what makes efficiency.

So that is the current news about the prospects of programmerless programming. The implications of these developments will be reviewed later, and your views on them are invited.

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Satisfied S/32 User Surprised by Others' Complaints

By Dan J. Dybwad
Special to Computerworld

I continue to be surprised when I read in *Computerworld* about some IBM users being unhappy with IBM. Everyone we've dealt with at IBM has been fantastic.

Bradshaw Gravel Supply placed its order for a System/32 about two weeks after its announcement in January. During our selection process, we were impressed with the System/32's capabilities, flexibility and competitive price.

The Contractor's Management Accounting System (CMAS) was also ordered to provide payroll, job costing, accounts payable and general ledger accounting for four companies – a paving contractor, a sand and gravel contractor, a concrete supplier and Bradshaw. This meant that, for the first time in their history, these four companies would be utilizing the same processing system.

About two months after placing our order, our System/32 rolled off the moving van and into our machine room. Forty-five minutes after the customer engineer arrived, our system was operational; 15 minutes later we keyed in general ledger master file records.

Our customer engineer has had to come out only twice since then – once for a minor repair and once to upgrade our printer from 50 line/min to 155 line/min.

Data file conversion on a "part-time" basis required about four weeks, with full operating ability reached after another four weeks. The CMAS package has been improved since its first issue, and as a programmer I am impressed with its flexibility.

We have nearly completed writing our own accounts receivable system, which will update the CMAS general ledger and job costing. Incidentally, we plan to market this package to other System/32 users in the near future.

Last year, two employees spent two and one-half days each week processing the payroll for just one company. Now one operator runs the payroll for four companies in about two days, freeing the employees who formerly processed the payroll to perform higher level work.

When the employee for one company worked briefly for one of the other three companies before the System/32 was installed, a long series of journal entries and job-cost postings had to be performed. Now such transfers are all handled by CMAS, which results in great savings in time and provides a better audit trail for our auditors.

We are a satisfied user of the System/32.

Dybwad is installation supervisor and programmer at Bradshaw Gravel Supply, Inc. in Arvilla, N.D.

Reader Commentary

Women Don't Want Promotions

By Jack M. Wolfe
Special to Computerworld

Much has been written about discrimination against women in DP. Salary differences cited in programming, for example – $265 for men against $257 for women [CW, Aug. 6] – were attributed to discriminatory practices. No recognition was given to length of employment.

In my experience, I have observed much more voluntary termination of employment by women programmers than by men. Women programmers have resigned when their husbands' employment changed to another city, for maternity reasons, to change careers – to take positions as teachers, for example, for which they prepared originally.

The average period of employment of women programmers is noticeably less than that of the men, and the average salary differential reported appears far more likely to be attributable to this factor than to discrimination against women programmers.

Don't Want to Be Supervisors

Regarding promotion to supervisory positions, I have observed that most women programmers I have known did not want such positions.

Project leaders and managers are generally expected to stay after hours for conferences; to many women programmers, definitive starting and stopping times are utterly essential because of their home responsibilities or social life.

Managers, too, are often required to work nights and weekends for special computer runs. This kind of schedule is often more than can be undertaken by a woman because of her family and social requirements.

It appears likely the smaller representation of women among supervisors is attributable to a substantial extent to the fact that many capable women do not choose to make their family and social lives subordinate to the responsibilities of a supervisory post in programming.

In a random sample consisting of about 1,000 job applicants who had majored in mathematics or computer science in college and who had taken a programming aptitude test I developed, 60% were men and 40% women. These persons were tested in 98 companies and government agencies in the U.S. and Canada, and the test was validated by a U.S. federal agency.

While the women's ratings on the test were somewhat higher than the men's, the difference was not sufficiently large to be considered as established with statistical significance.

I believe the difference in employment figures is merely a reflection of the fact that more men than women apply for programming positions and should not be viewed as evidence of discriminatory practices against women applicants.

In business programming, for example, a background in accounting may be desired by the employer, but the number of men students in accounting in college is far greater than the number of women students in that major.

Applying the principle of Occam's razor, I do not find substantiation for the hypothesis of discrimination against women for employment in programming.

Wolfe is a professor of information sciences at Brooklyn College.

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Use in Contracts Important

Definition of 'Software Program' Can Vary

From a Legal Viewpoint

By Roy N. Freed
Special to Computerworld

A software program is a software program is a software program – or is it?

Our question for today really is, "What does the term 'software program' mean for legal purposes?" "For what legal purposes?" What a way to start a column!

Webster's New Collegiate Dictionary defines the noun "program" as a plan for the programming of a computer or a sequence of coded instructions that can be inserted into a computer.

That is a definition for general-purposes – to serve the diverse group of people who might refer to a dictionary. It probably is insufficient for our needs for this discussion. It well might turn out to be actually misleading.

There are many situations in which it is essential to define the term "software program" or merely "program" for various legal purposes. But that universe still is too broad for us to work with. We must persist and ask, "For what legal purposes?"

Different Purposes

There are a number of different legal purposes for which a definition of that term is required. They include, briefly, such diverse considerations as the determination of how various tax laws will be applied (income, tangible personal property and sales taxes); how people can secure proprietary interests in software programs to enable them to prevent their unauthorized use and what criminal laws apply to thefts of software programs; what liabilities marketers of software programs have to their customers and to third persons who might be harmed by their use and the related question of how they can get insurance coverage for those exposures; and how the antitrust laws might apply to business arrangements of marketers of software programs.

Each of these facets is worthy of at least one separate column and will be so treated. Hence, let's use this column to develop the analytical approach for identifying alternative possible definitions and their respective propriety and to point out how to benefit from that operation.

The term "software program" can be used to mean a process for processing information automatically by an electronic digital computer.

Such a process would be analogous to the myriad familiar processes for processing tangible materials, such as refining crude oil, reducing ores, producing paper, galvanizing iron and making automobile engines. I consider this definition to be very appropriate in many legal circumstances and use it very often.

Alternatively, the term can be, and frequently is, used to refer to the magnetic tapes or disks or other computer media that are the means for generating the series of electronic signals or impulses for setting the internal memory of a CPU so it will be able to perform the desired processing.

It is so used in many program license agreement forms, including the IBM Program Products License Agreement.

Connotations Vary

Each of those characterizations has very different important legal connotations because of our prevailing scheme of legal rules relating to transactions, properties and relationships.

It might irk some readers to talk about the different rules applicable to tangible personal property, goods or products; to intangible personal property; and to the rendering of services. But – until our legal structure is altered – that's the way we have to talk and classify circumstances to determine their legal significance.

Woe unto any who ignore legal consequences. The adverse impacts often can be severe.

Speaking very generally, if something is tangible personal property or goods, then taxes and liability rules pertinent to that type of property will apply. If an activity entails the rendering of services, quite different legal impacts in those areas could be encountered.

Furthermore, if a transaction constitutes the licensing of a process, still other legal consequences follow.

Let me give some examples. If something is called "goods" and if harm results from its use because of a defect in it, the manufacturer might be liable without regard for the fact that no amount of care would enable it to avoid the defect.

In contrast, if the transaction is deemed to be the rendering of services rather than the furnishing of goods, then the supplier is liable for only the harm that resulted from its failure to exercise reasonable care.

In the tax area, if a tax applies to tangible personal property and not to intangible personal property, to services or to licenses to practice processes, then one label exposes someone to tax liability and another does not.

Choice Exists

In approaching this matter of defining the term "software program," nonlawyers should recognize definitions do not always follow inexorably from particular physical phenomena. Often there is some ambiguity of understanding, and hence a choice exists.

Knowledge of the various legal consequences of the alternatives can help in selecting the one to opt for and promote by legal argumentation. Computer specialists also should recognize that, in many situations, a thorough knowledge of the facts from a legal perspective is indispensible in order to adopt a proper definition.

Especially in the computer industry, technical jargon, which has been adopted without attention to the legal consequences, frequently obscures the facts and must be pierced to avoid its misleading effect. We must not take computer buzzwords literally in making legal assessments. We must develop careful understanding of the nature of the phenomena or properties involved.

We must also recognize we engage in legal argumentation when we draft software program license agreements, as well as other legal documents. We are writing scenarios or setting stages for the making of important legal decisions by courts, tax collectors, and others similarly situated.

In summary, it is essential to examine phenomena and identify possible legal characterizations, then to select the characterization considered to be the most desirable and finally to talk about it in legal documents in a way that enhances the characterization.

Contract drafting is not an activity to be performed cavalierly. The consequences of mistakes can be severe.

Letters to the Editor

No Impact at Roots

In regard to the protracted controversy over the Certificate in Data Processing (CDP), I would like to assert that most opinions, pro or con, are based on an erroneous premise.

The opinions vocalized to date never seem to impact at the root of the issue – the real meaning of being a qualified CDP, licensed or not.

On what basis does a person dare claim to be a DP professional; or indeed that DP is a profession? On the basis of the span and depth of knowledge required.

A CDP must demonstrate knowledge, hopefully gained through competent experience and education, in the full spectrum of DP.

I assert this makes the CDP holder a professional in the full sense of the word.

Dan Remy

Miami, Fla.

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THE WORD IS GETTING AROUND.

RAYTHEON DATA SYSTEMS

Would Certify Equipment

AT&T Has Role in Plan to Open Telecommunications

By Joe Wright
Special to Computerworld

As I wrote in "Don't Break Up AT&T – Just Break Up Its Monopoly" [CW, Sept. 17], I believe there should be a free market in telecommunications.

And I have a proposal for bringing that about:

• The provision of telecommunications services and equipment should be open, without restriction, to anyone with the economic and technological wherewithal to enter the market.

Consequently, all laws that restrict market entry should be repealed. The system of filing tariffs and the network of public utilities commissions should be abolished, with prices being determined fully within the free market.

• Because AT&T has had an exclusive market in these areas and because other suppliers might have come into existence had this exclusivity not existed, AT&T should be required to provide local loop connections to any and all specialized common carriers who agree to meet reasonable technical criteria required to interface with AT&T facilities.

This should be for some specific period of time hence (perhaps five years) to allow this market to open up, after which time the decision to allow interconnection to AT&T facilities would become an exclusive prerogative of AT&T.

• This should also be the case with interconnected telecommunications equipment. For a definite period of time, AT&T should be required to connect any private equipment that meets reasonable technical criteria.

• Any manufacturer of telecommunications equipment should apply to AT&T for certification of any equipment intended to be connected to AT&T facilities.

Certification is necessary because, unlike passive electrical appliances, telecommunications equipment generates current that can be dangerous and harmful to the network and has a perfect right, as a consequence, to demand that equipment meet criteria of safety and performance.

The phase "AT&T Approved" would come to mean in telecommunications what "UL Approved" means in electronics.

• Any dispute about the reasonableness of technical interconnection criteria would be settled by an independent team of scientists and engineers to which the disputant and AT&T mutually agree.

• Reasonable fees should be set for equipment certification and the full expense should be borne by the manufacturer and/or the supplier and/or some intended user.

• Certified equipment would be installed without protective coupling arrangements. AT&T would reserve the right to require protective coupling arrangements for all uncertified equipment; the expense of such arrangements would be borne by the equipment manufacturer and/or supplier and/or user.

Once uncertified equipment becomes certified, the coupling arrangement could be removed, if desired, with the cost of removal borne as above.

• From the outset of decontrol, AT&T would be completely free to offer any service and/or equipment at any price it desired. No punitive actions or new restrictions on AT&T's competiveness would be allowed.

In the context of worldwide telecommunications, AT&T has many achievements to its credit. Barring it from engaging in competition could destroy the whole system, setting American telecommunications back for years.

All the other suppliers of equipment and services put together could not step into the huge vacuum that would be left by an AT&T collapse.

• At the end of the set period of unrestricted interconnection, all requirements that AT&T provide connections, certifications, etc. would cease and the decision of whether to continue with these practices would become exclusively AT&T's.

All other common carriers and equipment manufacturers would have the same prerogative with respect to their own systems.

The above elements indicate, in broad outline, a proposal that would create a free market in telecommunications.

I realize that there are many, many details that would have to be worked out, but this is the direction in which we must move if we are going to be assured of having the best telecommunications service.

Reader Commentary

Letters to the Editor

Wrong Question Asked

Miles Benson started off by asking the wrong question – "Which is more important, efficiency or maintainability?" [CW, Sept. 10]. He then expanded this question into several smaller ones, each wrong, and finally concluded the article by once again asking the wrong questions.

In between he constructed a rather pat scenario peopled by Mr. Off-the-Wall and Mr. Goody Twoshoes.

Benson should have asked when one should strive for tight code and when one should strive for more generality. He should have asked this in relation to the type of application, the type of equipment to be used and the environment, or type of shop, in which things are to take place.

While I'm at it, I'd like to take issue with two other points in the article. You *can* ask a high-level language man to look into an operating system if he understands what he's doing, and you *can* ask a "readability" man to solve intricate problems if he has his thinking processes coordinated and organized.

Glenn Newkirk
Union City, N.J.

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Are winners born or made?

In Setting Up Credit Card Operation

Decisions Made at Design Stage Keep System Humane

By Bertram Tobin
Special to Computerworld

In the course of setting up automated credit card systems, a number of design points arise which can legitimately be handled in more than one way.

When we at the Chase Manhattan Bank National Association designed the system for our credit card operation in 1972, we made certain decisions which we have since been able to review in actual use for some years.

From this experience, we now believe both that the decisions we made were by and large correct and that the policy assumptions on which we hased our decisions were valid.

Curing Delinquency

First, we reviewed the normal practice with regard to delinquency operations. In the classical method, a customer receives an automated, standardized letter whenever the review cycle indicates his payments to date are less than the payments due.

We rejected this method of determining when to send out delinquency letters and improved the technique by deciding to send letters when they are really needed.

Instead of sending out delinquency letters based upon payments due, we instead chose to base this decision upon the payment pattern. We decided to identify what appeared to be acceptable payment patterns and not to send out letters in these cases.

This change meant we would send fewer letters out, since no one who was not theoretically delinquent was considered for dunning letters.

In particular, the situation where a single payment has been missed but the later payments have been coming in regularly does not receive a dunning letter under our technique. We believe this omission improves our customer relations as well as reducing costs.

In the case where dunning letters must be sent, we decided to use the odd/even technique to avoid sending the same standard letter out repeatedly to a delinquent cardholder. We have since found this improves our chances of getting action from the dunning letters.

The problem of how to handle lost cards (which may simply have been misplaced instead of being really lost) also came up for consideration.

Our solution was to take immediate action both to stop further charges against the number of the lost card number and to continue to provide normal services to the genuine cardholder.

The action taken to achieve this involves the automatic issuing of a new account number, a letter thanking the cardholder for his lost card report and requesting his signature on certain legal formalities and a monitoring to determine which transactions bearing the old number should be intercepted and which should be transferred to the new account.

Another area in which we found we had to choose between different practices came up in designing the address change operations.

The question involved whether original bills should be mailed in "Do Not Forward" types of envelopes. The idea was to obtain notices of moves as quickly as possible.

In practice, however, this often resulted in the original bill never reaching the customer, who instead just received dunning letters. We therefore felt the priority of updating of the mailing address rather than delivering the original billing was incorrect.

As a result, we decided to have original bills forwarded and use other letters to try to keep mailing addresses up-to-date.

Consumer Advocate Systems

There are many other features to the system, but above are sufficient to illustrate the basic system design decisions that we made. They were based on a deliberate policy we adopted to regard those of us in system design as "consumer advocates."

Computers may not be human, but system designers can prevent them from acting inhumanly. We can avoid computer actions insulting our customers directly or indirectly, and this is what we attempted to do throughout the operations.

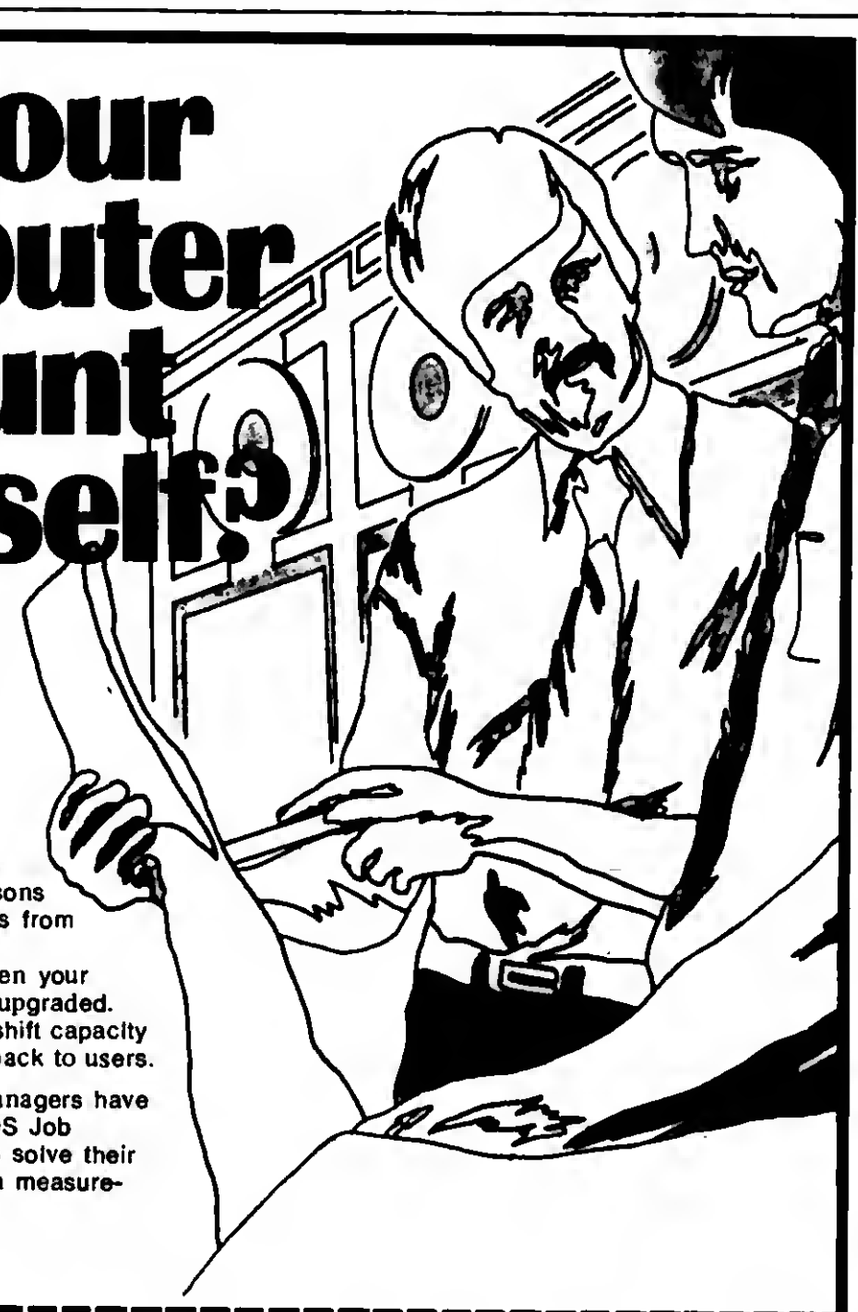
Our experience is that this philosphy is practical, so currently we see no reason to change it.

Tobin is a vice-president of the Chase Manhattan Bank National Association in New York City and has been active in credit card system design standards at both national and local levels.

The Professional Practices column is coordinated by Alan Taylor and the editorial department of Computerworld. *Articles should be sent to the Professional Practices Page, c/o* Computerworld, *797 Washington St., Newton, Mass. 02160.*

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Letters to the Editor

Unreasonable Force

I was appalled at the positive review in the article, "Passage of Abortion Law Credited to Mini Data" [CW, Sept. 17].

This was a classic example of the unreasonable force of a hard-copy computer printout.

It was not even obvious to the reader of the article that the proposed solution would be correct in checking the population growth.

Nevertheless, the article clearly suggested there are individuals in the Agency for International Development and the National Science Foundation who were very effective in imposing their own type of final solution to the human population problem.

What size computer do they plan to use to push euthanasia?

William R. Dachtera
Poughkeepsie, N.Y.

Watch Employee Loss

The article, "View From Below Shows Manager Should Leave His Quirks Home" [CW, Sept. 10] really came home with what a manager is all about.

Those managers who read the article and are convinced they are the "Carls" or "Eds" in their shop should recheck Category 6 (Loss of Employees).

In most cases, if the score is not "minimal," they had better re-evaluate themselves or, better yet, have their employees do the evaluation.

Bryan Biesanz
Anchorage, Alaska

Debugging Help Asked

Computer literature dealing with debugging programs seems to concentrate solely on those situations where the source listing is available to the debugger.

I am in a position where it is necessary to resolve data exceptions and other problems for programs which are maintained at a distant site.

Is there a document for IBM 360 DOS Cobol users which details step-by-step procedures for debugging from only the core dumps?

Kenneth L. Morris
Colorado Springs, Colo.

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Mix of Vendors Concern Heavy T/S Users: Info-Dyne

By Don Leavitt
Of the CW Staff

MINNEAPOLIS – Thirty-one companies that heavily utilize remote-computing services spend a median $500,000/year – a mean $900,000/year – with an average of seven vendors and "one of the problems faced by these companies is control of outside expenditures," according to a recent study.

But "few vendors are making this [control of expenditures] an easy thing to do," a spokesman for Info-Dyne, Inc., the organization that conducted the study, noted.

Unlike the acquisition of in-house systems which tend to be major corporate decisions, the startup of remote computing through an outside vendor is low-key. It happens often because a vendor salesman calls because an end user, and not necessarily the DP staff, has a problem.

Not only do various vendors gain entry into a user organization this way, but the same vendor may gain entry at various points within the organization, sometimes without either the vendor or user organization recognizing such a situation is developing.

That was roughly the situation that led to the just-completed study, according to J. Richard Sherman, president of Info-Dyne.

One of the major users saw itself falling into the multivendor, uncontrolled mode of operation and asked Info-Dyne, a consulting house, to evaluate the vendors to determine which would be the best for the user.

Market Research Effort

To put its clients' concerns in perspective, Info-Dyne in effect fell into a market research effort, analyzing 16 service suppliers as well as the 32 user organizations, which were visited and interviewed in depth according to a structured questionnaire by Info-Dyne personnel.

The top issue for about 75% of the users was the cost and cost effectiveness of the services. Next in importance were the service factors – response, reliability and ease of use.

This area, coupled with vendor support of remote job entry service, "is a key issue for virtually all users," the study said.

A large number (42%) of the users key on combined service, either with common files or an easy link between RJE and conventional, interactive time-sharing.

"The increasing use and importance" of internal data bases and information access needs "are most evident to these users," Sherman concluded.

"Although two of the unique and real values of time-sharing services are the ability to share costs of specialized data bases and networks with multiple users," he went on, "only four [13% of the users interviewed] key on special data bases and seven [23%] on network needs." In fact, at another point in the study, Info-Dyne reported 50% of the 31 companies' usage is local only.

Application programs and technical support available through the vendors are also key issues for some users, but neither assumes "as high a level of importance as might be expected," in Info-Dyne's view. This can quite likely be attributed to the general size and competence of this set of users, the report added.

In-house DP groups are becoming more involved with selection of the remote-computing vendors for a variety of reasons. Seven of the user sites had excess capacity of their own and were more careful than they might otherwise be about going "outside" for more computing capability.

Compatibility of environments – presumably with the thought that programs used "outside" might ultimately be brought in-house – was a serious concern, however, of only three users contacted.

For the vendor portion of its study, Info-Dyne designed a benchmark effort to provide qualitative and quantitative data on a number of key points.

Info-Dyne, Inc. is at Suite 4444 in the IDS Center, 55402.

'Super' Covers Reporting Rules For Payroll, Pension, Personnel

TEWKSBURY, Mass. – The Super package from Wang Computer Services is said to combine pension and personnel administration modules and meet federal requirements in those areas with the PHI Payroll II system that handles payroll and income tax calculations at federal, state and local levels.

The result is an integrated system, written in ANS Cobol for IBM-based installations, that meets most of the mandatory reporting requirements that face businesses today, a Wang spokesman said.

Super Pension is designed to meet all the requirements of the Employee Retirement Income Security Act of 1974 (Erisa) and Wang said it will add future changes to guarantee compliance with new regulations as they are enacted.

Erisa compliance reports for government agencies and for fund administrators, on-demand information for individual plan participants and daily operating data, as well as basic management information, are all produced by the Super Pension module, the vendor said.

The Super Personnel module is said to handle skills inventory, benefits, manpower planning, budget analysis and individual employee profile information.

It is designed to meet the current requirements of the Equal Employment Opportunity and the Occupational Safety and Health agencies "as well as all future demands that are anticipated from these agencies," the Wang spokesman said.

Logic built into Super Personnel also satisfies the diverse "but equally stringent" needs of union and management, he added, noting Personnel works in conjunction with the Payroll module.

Super Payroll – in reality, PHI Payroll II – can be tailored to the user's needs without reprogramming through the use of parameter cards.

As many as 99 earning/deduction categories are possible and as many as 8,000 characters of personnel and management history can be stored about each employee, the vendor said.

A report generation module supports custom output in addition to the classic documents produced by most full-blown payroll systems: paychecks, W-2s, 941As, workmen's compensation accounting reports and, in the Canadian version, UIC Status reports, T4As, TP4s, TP4As and records of employment.

Super is available on a lease or purchase basis. Prices range from $25,000 to $75,000, depending on the application modules and optional features delivered with each system from Wang at 836 North St., 01876.

Flexibility Key to 'Nomad' DBMS

NORWALK, Conn. – With the implementation of a data base management system (DBMS) called Nomad on the remote-computing network of National CSS, Inc., subscribers apparently now have some of the advantages of both hierarchically organized and relational data bases.

Under hierarchical schemes, movement through a data base is controlled by "pointer" elements within records that aim the system at the next logical record, whether of a more general or more detailed nature than the current record. With some such systems, users can move in either direction at will.

"Pointers" are one of the keys to a DBMS' ability to reduce data redundancy. As long as a user can get to a piece of data from various points, there is no need to store it more than once, according to this view. But pointers take storage space and time to handle.

A relational approach overcomes the time and space problems of pointers and allows far more flexible use of the data, its advocates contend.

As usual, however, there is a cost for these benefits. In order to identify all the records sought by a user's request, each record must have a consistent Identifier field; data redundancy therefore reappears to a degree.

Nomad appears to allow the choice of approach to vary from one data file to another so a user may access each as he deems most appropriate. User control for reporting and for data handling – updating and the like – was stressed in the vendor's announcement of the capability.

Nomad is available throughout the National CSS network, a spokesman noted from 300 Westport Ave., 06851.

IBM Wooing Hard-Goods Dealers

ATLANTA – IBM's General Systems Division has extended its library of Industry Application Programs for first-time users of the System/32 with the recent release of the Hardgoods Distributors Management Accounting Systems (HDMAS).

The latest set of turnkey programs was designed for small businesses in the appliance; electrical and electronics; hardware; plumbing, heating and air conditioning; industrial supply; and paint and chemical industries.

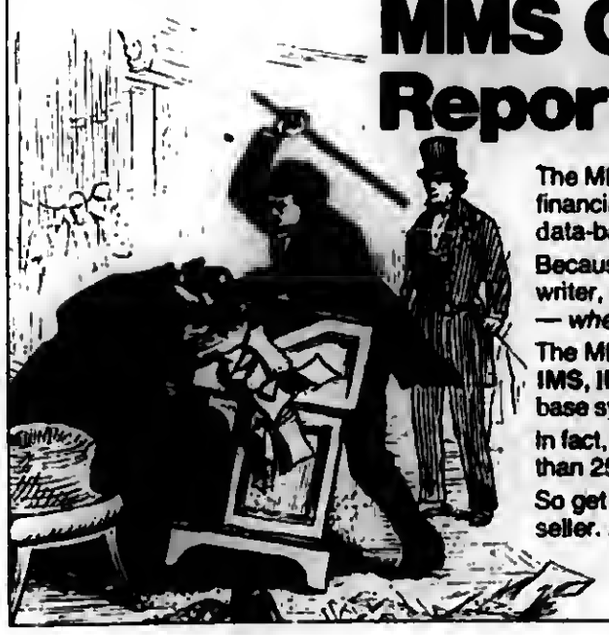
Applications supported by the programs include billing, accounts receivables, sales analysis and inventory control, IBM said.

HDMAS may be ordered in two different configurations for each of the six supported industry areas. The first package, which offers billing, accounts receivable and sales analysis, has an initial cost of $2,500 and a monthly license fee of $120.

A second package adds inventory control to the applications covered by the first. This version of HDMAS has an initial cost of $2,975 and a monthly license fee of $140.

The lowest priced model of the System/32 rents for $770/mo under a three-year lease; the hardware and software to get a HDMAS user in operation costs less than $1,000/mo, IBM noted.

First deliveries of the HDMAS software are scheduled to begin this month, the spokesman said.



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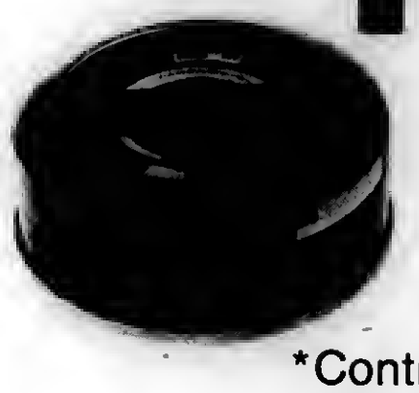
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CONTROL DATA CORPORATION

Even Without DBMS, Analysis Clarifies Data's Value

By Ian Palmer
Special to Computerworld

The increasing use of data base technology is leading to new attitudes toward data processing. The emphasis during systems analysis has traditionally been on the "processing"; with the data base approach, the emphasis is changing toward the "data" which the application systems are based.

Traditionally, data structures have been designed for particular applications – so-called "application-dedicated files"; the data base approach is centered around the "shared data resource," with data structured independently of individual application requirements.

Data analysis is concerned with organizing an enterprise's data resources. An enterprise can neither plan nor carry out its day-to-day operations without continued use of its data, whether this resource be stored in the computer, in clerical files or in the heads of key personnel.

The data clearly has a value – it is expensive to collect, to maintain and to organize.

Analysis Objective.

The objective of data analysis is to determine the fundamental nature of an enterprise's data resources and to organize and document all relevant facts concerning this data. If handled in a disciplined way, data analysis results in a new understanding of the data resource and in a recognition of ambiguities and inconsistencies in the meaning and use of data.

These may be as obvious as two departments using the same term to describe differing types of data or as complex as consolidated data being incorrect because the corresponding source data has been collected under varying time frames.

Data analysis involves more than merely identifying and defining data elements; it is concerned with validity controls, confidentiality, volumes, coding systems, storage, ownership and, in fact, all aspects of the data itself as opposed to the details of its processing.

Methodology Needed

Recognizing the need for data anslysis is only the beginning; a methodology to assist is needed to ensure the analysis is rigorous and consistent.

Once the area of data to be analyzed has been defined, the first step is to determine the principle entities with which the enterprise is concerned.

In this jargon-riddled technology, the term "entity" implies no more than the things (persons, places, events, objects) of interest to the enterprise. The distinction between "entity" and "entity type" must be kept in mind, e.g., between "customer" as an entity type and "XYZ Corp." as an entity.

Each entity type must be capable of precise definiton and each entity must be uniquely identifiable – for example, an enterprise may define a customer as a person or organization that it invoices to; each customer may be uniquely identified by his name and address.

The next step is to construct an entity model (the term "corporate data model" is also used) of that part of the enterprise being analyzed. The relationships between entity types are represented in the entity model; in the data base it is the relationships between entitites that are represented.

Thus customers may be related to the orders they place, to the salesmen who service them and to their delivery points. Orders are related to the products on the order and the warehouses from which they are supplied.

Consider Attributes

The properties or descriptive values associated with entities must also be considered during data analysis. These are termed "attributes."

Among the attributes of customer entities are likely to be name, address, account number, date of last payment, size of customer and credit rating.

The recognition and definition of attributes is not so critical that it need be complete during the early stages of data analysis. On the contary, data analysis is very much a reiterative process, and it is unlikely a completely satisfactory data model will be obtained on the first iteration.

Interestingly, some of the concepts developed by E. Codd with his relational data base have been found be be of more immediate applicability as part of the data analysis methodology. An entity type is similar to (but less rigorously defined than) what Codd termed a "relation."

Thus Codd's normalization process can be used to examine the attribute types associated with an entity type to ensure there are no hidden dependencies between attributes which ought to be represented directly in the data model.

For example, if a customer has several accounts, then the date of last payment may well be directly related to account number rather than to customer, suggesting an account entity type should be included in the data model.

Data Basics

The concepts of entities, attributes and relationships provide a framework around which a data analysis methodology has been developed and successfully applied by consultants from Caci's London branch. This discipline must include full documentation at each stage, and it is here the data dictionary (which may be automated or clerical) has been found to be an essential aid.

Eventually the data analysis phase may progress into data base design when the data model is mapped onto the logical structures provided by the data base management system (DBMS).

To make such decisions, some knowledge of the application usage of the potential data base is needed at this stage.

A flexible data base structure, representing the real meaning of the data to the enterprise and independent of the potential applications which may access the data base, will be achieved only if a thorough data analysis is first undertaken. Early data base users found – to their cost – that data bases designed initially to support a specific application were relatively inflexible.

Palmer is manager of the data base and teleprocessing group of the London office of Caci, Inc. International.

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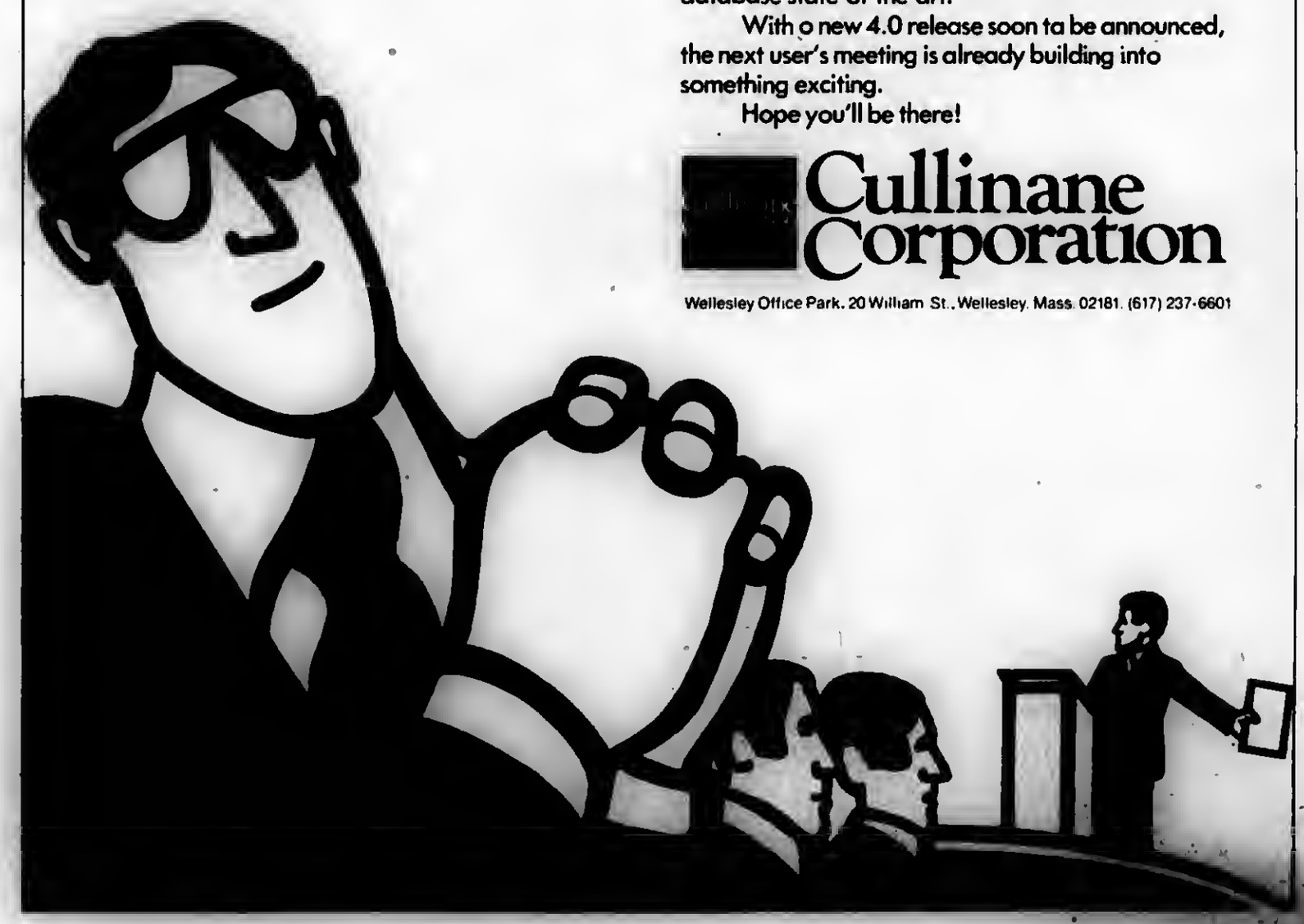
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Programs, JCL Controlled

Hopkins' DP Staff Lauds The 'Librarian'

BALTIMORE – A teaching hospital differs radically from all other institutions which bear the name "hospital."

At Johns Hopkins, nearly 500 post-doctoral students are educated in more than 70 specialties of clinical medicine ranging from neurosciences to primary care. In cooperation with the Johns Hopkins School of Medicine, the clinics and patient care facilities serve as training sites for 480 medical students.

A variety of patient care services is administered at Johns Hopkins. Almost half a million outpatient visits and over 300,000 days of inpatient care were recorded last year; almost two and one-half million laboratory tests were made.

The hospital provided services for 200,000 X-rays, administered 20,000 blood transfusions and served almost 900,000 drug doses and prescription orders. The staff at Hopkins consists of 1,500 physicians, 1,100 health professionals, 600 nurses and 3,000 nonprofessionals.

To help maintain order at this massive health care and teaching facility, Johns Hopkins' DP division is concerned with records and procedures for patient registration, nursing, laboratory, X-ray, dispensing medicines, consultations, diets, supplies and operating room activities. Its systems handle order entry, collections, billing, medical records and surgical procedures.

The department has a 256K IBM 370/135 and a "three-quarter meg" 370/145 which run 24 hours a day, seven days a week.

In addition to programs written in-house, the staff utilizes a number of packages from outside vendors, covering both application and system support areas. One that falls in the latter category, for example, is The Librarian source program retrieval and maintenance system from Applied Data Research, Inc. (ADR).

Ensures Stability

"That package not only controls and protects the assets of Johns Hopkins Hospital, but ensures stability and continuity in the day-to-day computer operations and computer production processes," according to William P. Cummins, manager of systems development. Cummins' department has 30 people in project analysis and operations support.

"Programmers used to keep source statements in card trays in their offices,"



It's not all paperwork for William P. Cummins, manager of systems development at Johns Hopkins.

he noted recently, "If a programmer left, there was a potentially chaotic situation because each man had his own method of filing and his own system for keeping control of his work.

Eliminates Card Files

"Now, source statements are permanently filed on disks and tapes," he said. "This totally eliminates the need for cards and card files. A programmer may have as many as 80 programs and 30,000 cards, and one can imagine the difficulty in maintaining control without Librarian.

"Not only does the package give us a more stable production environment, but it also gives us backup and security for our 1,281 programs."

The ADR software is used for fast update, for storage, for making changes, for storing macros and for changing JCL procedures. Using it, Hopkins has an organized approach to system backup and protection: it stores everything on tapes on one Librarian master file.

Outpatient System

As one example of its capabilities, "The Librarian tells all about the changes and content of our outpatient systems," according to Wayne D. Blackman, systems analyst of outpatient systems.

"Without it, we'd have to look at each one of our system's 98 programs individually," he noted.

"It's easy to keep and easy to maintain. From the master file index, once the program is in production, we can verify its source," Cummins agreed. "The librarian helps us audit, verify, backup and protect.

"We suffer some turnover of personnel. With the Librarian, we don't have a turnover problem. You know the source programs are all there. You know they're all OK."

"JCL for DOS also changed, created and stored on the Librarian," Howard Buckholtz of operations support noted. "We create a jobstream every day.

"It is extremely flexible to use The Librarian under OS to take DOS JCL. It replaces all card decks – there's no need for card readers and punches.

"We really save hundreds of dollars every month by not having to lease that kind of equipment," he said.

Getting your data from here to there

A special supplement on Data Communications Network Configurations in the November 26th issue of Computerworld.

You can run into a lot of hangups planning and operating a data communications network. Your DP staff - including managers and technical specialists - has to make important decisions on a lot of expensive items like terminals, line speeds, modems and network configurations, to name a few. These networks are usually planned years in advance, and when they are put together, they're built to last. Yet the industry is in a constant state of change, and networks are often being upgraded with faster equipment, newer sites, more efficient lines, etc. So proper planning is essential.

We'll be taking an in-depth look at the changing world of data communications networks in the November 26th issue of *Computerworld*. And we'll give special emphasis to how they should be planned. Edited by Ron Frank, this supplement will be filled with input from users who understand this environment with all its implications, and you'll get the benefit of their experiences. You'll see stories that evaluate common uses of data communications, like batch versus on-line, private lines versus dial-up lines, all-digital versus analog lines, and the use of newly emerging carriers. And you'll see stories that point out ways you can get the least cost on your configurations.

If you're involved with data communications - or if you will be in the future - you should be reading this special supplement in the November 26th issue of *Computerworld*. And if you're marketing data communications products or services, you should advertise them here. But don't miss the November 7th ad closing date. Contact your area *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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'TP2000' Gains Tcam Interface

AUSTIN, Texas – MRI Systems Corp. has announced several enhancements to TP 2000, a transaction-oriented teleprocessing monitor which operates in IBM OS and VS environments.

To provide support for more potential users, for example, an interface to Tcam has been added to the previously available Btam linkage.

Other features are said to include mapping support for both input and output for non-IBM formatted terminals, such as the Hazeltine 2000, and improved transaction error recovery.

Conversational "scratch-pad" support allowing the programmer to create interactive applications is also part of the update, MRI said.

New macro instructions are included to simplify the definition of the user's telecommunications network, and additional security coding options – user-selectable – are said to protect the data once it is in the network.

A simplified version of the TP 2000 system code itself and a simplified version of the interface from the user's application code to the system code are other enhancements to the monitor.

TP 2000 can be used in conjunction with MRI's System 2000 data base management system or in stand-alone mode. The monitor itself is said to provide multitask message handling, switching and processing facilities that interleave telecommunications line control, user application code and data management control.

Reentrant coding allows all system service routines to be shared by multiple threads; parallel processing of messages is performed with automatic system resource management.

TP 2000 is available now for $20,000 from MRI through P.O. Box 9968, 78766.

PL/I Option Not Good or Hidden

By Domenick Vitulli
Special to Computerworld

In his report on the "'Hidden' PL/I Option" for providing in-line I/O code [CW, Sept. 10], David A. Souerwine neglected to mention the Total option applies only to users of the OS PL/I optimizing compiler and is not available to DOS users.

He also commented there is "no trade-off involved" when using this optimization option. This is not the case – in-line code for an I/O statement using the Total option causes over 300% more compiled code than is normally produced for the I/O operation.

Because the library subroutines that handle I/O are present regardless of whether Total is specified, this presents an overhead to be considered if program size is critical.

What troubled me most about Souerwine's remarks was the allegation the Total option is hidden from the user and undocumented in the IBM technical support manuals.

After a quick check of these reference sources, one finds in-line I/O code is mentioned in the OS PL/I *Optimizing Compiler General Information, Language Reference,* and *Execution Logic* manuals, hidden in chapters with such obscure titles as "Optimization," "Record-Oriented Transmission" and "Efficient Programming."

Let us hope all such "hidden" options are as difficult to find.

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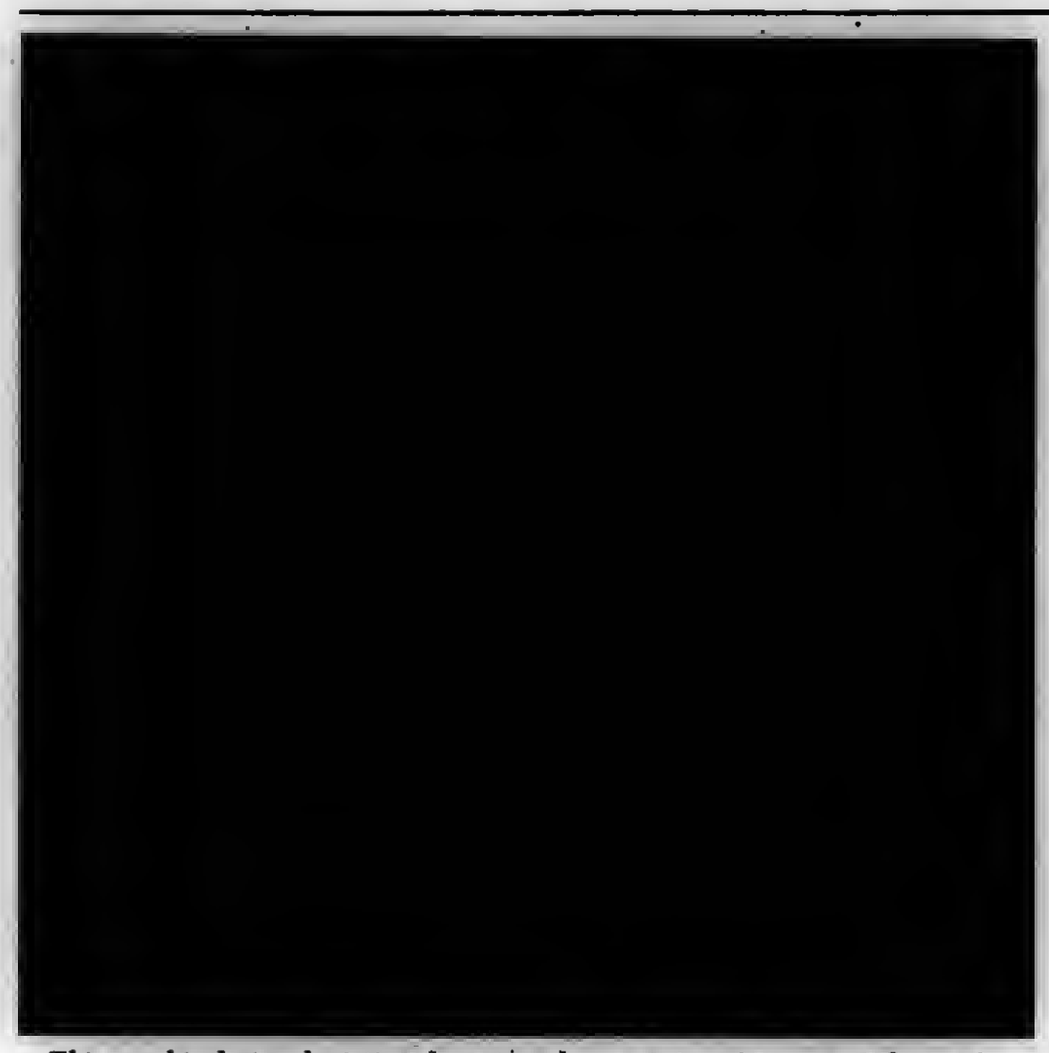
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DP Dialogue

Notes and observations from IBM which may prove of interest to data processing professionals.



This graphic design depicting the outward progression of squares and triangles symbolizes the continuing evolution of System/370.

System/370: The Continuing Evolution

In June 1970, IBM announced the System/370. Since then, a wealth of new products have continually extended the versatility and productivity of the system. Thousands of users now have a proven 370 base for their future growth.

Recently, DP Dialogue asked Gale Aguilar, a key systems marketing executive in the IBM Data Processing Division, to put the System/370 in historical perspective. We asked him:

Now that the 370 is entering the fifth year of product life, can we make any analogy with the 360 five years after its introduction?

"From a hardware standpoint, the 370 is in a similar position to the 360 back in 1968, in that they are now solidly installed. We are now entering that period where users are just beginning to exploit the full potential of the 370's new architectural base. New and improved 370 software systems are being added to this base at an ever increasing rate. This expansion involves far more complex systems in response to the growing need for communications. By that I mean the ability to retain vast amounts of valid business data and to have this data available to all appropriate users within that business for immediate decisions."

What are some of the benefits a user can gain from this new architecture?

"Compatibility is the foundation. Thousands of our customers are now in a position to take advantage of new technologies and subsystems with a minimum impact on their present applications, operations and programming. For instance, these customers can add new tape drives, new terminals, even new CPU's without losing their already-existing programming investment."

Wasn't this kind of compatibility important to the 360, too?

"It was. But it's fundamental to the 370. We now have a systems base that may support many generations of devices. With this architecture, users can keep pace with technology that appears to be developing faster than ever before in every area of data processing."

Why is it so vital to keep up with the new technology?

"Because the latest technology offers continually higher productivity benefits. This is especially important when you consider that almost two thirds of data processing costs these days are represented by people investment. Our new product announcements are geared to the concept of across-the-board productivity improvements. Virtual storage, an integral part of System/370, is itself the best example. The 3850 mass storage system and the new 3800 printer are also good examples of this."

We've been talking about the System/370 as a base for tomorrow's growth. But what about the day after tomorrow?

"It seems we will see more overlapping of computer systems than in the past. The 360 represented a huge technical leap forward, since it carried over so little from the pre-360 era. But the 370 began an evolutionary trend since it incorporated major portions of 360 technology. This overlapping trend

(Continued on next page)

Simulating Strategies With a New Interactive Retrieval System

Should the new plant be located in Texas or Maine? How many employees are needed to establish a branch office? How price-sensitive is the demand for chlorine?

Making effective business decisions depends on the ability to use large masses of information quickly and efficiently. A new IBM retrieval and formatting system, the Interactive Query and Report Processor (IQRP) can accomplish this objective with minimum effort. IQRP enables users to communicate directly and rapidly with the data files they need – using either typewriters or display terminals.

At the Chemicals Group of Olin Corporation in Stamford, Conn., for example, the use of IQRP is particularly valuable in the marketing area. William Rossiter, vice president for marketing, relates a recent decision: "Several months ago, we experienced an imbalance in demand for chlorine and its co-product, caustic soda, two of our major products. We needed to know the optimum production rate to satisfy these two fluctuating demands and the related inventory capabilities.

"Determining the optimal production tradeoff required a thorough analysis of the twenty industries which buy the two chemicals most heavily. In an effort to predict demand, we created a data base, from our own research information, which is stored in our System/370 Model 145. It indicates, by customer and by industry, how much of each chemical is purchased and what estimated share of that comes from us," explains Rossiter. "We also break out the information by geographic area."

That data base is now linked, through 3270 display terminals running under CICS/VS, to IQRP (an IBM Installed User Program). By using IQRP's flexible set of English-like commands, members of the marketing department can request the information they need from the available data files. The information can then be organized and displayed by IQRP in whatever form is desired. If the result of the first search is not adequate, the request can be modified repeatedly until the most relevant data is selected. Finally, a marketing strategy can be formulated.

IQRP's capabilities include ordering numerical data in ascending or descending order, performing a wide range of arithmetic operations and protecting file security with a password sign-on feature. Hard-copy reports can be obtained by routing the output to a high-speed printer.

"We have no doubt that IQRP will bring our users much closer to their own data," comments Martin Muller, director of information systems. "So far, we have several online data bases, all in the marketing area. These include the breakout of chlorine and caustic soda customers by state; a similar but larger file for sulfuric acid; and another file ranking customers according to the number of employees at each of their plants. In addition, we plan to set up an online credit status file for accounts receivable."

It was extremely important to Olin that its existing files and access methods be made compatible with IQRP with a minimum of time and money. "All we did was set up data description tables and define the fields and terms used to make requests. From then on, the system has worked quite smoothly," says Bill McMorris, manager of systems development.

"The ability to customize our inquiries through IQRP instead of having to wait for a formal weekly or monthly report is extremely useful," notes Alex Budd of the marketing services group. "In addition to indicating general trends, it helps us pinpoint exceptional cases more readily."

"We expect IQRP to play an increasingly important role in long-range planning by helping us simulate a wide range of marketing situations," adds Rossiter. "Our sales force is a very important resource. We want to assign our men to areas that will yield the highest profits per account. We believe IQRP can help us do that."



Tank cars at the Olin plant in Charleston, Tenn. are loaded with chlorine.



Celanese, a major producer of manmade fibers, retrained over 200 employees using computer-based training techniques.

Teaching New Skills with the Interactive Training System

One of the toughest jobs DP managers face today is education. As new applications are introduced in end-user departments, they must find efficient ways to train all kinds of personnel in an organization to communicate through terminals directly with the computer.

Learning to use terminals as a replacement for manual methods often requires detailed instructions. Now these instructions can be provided, at both central sites and remote locations, through an IBM Program Product called the Interactive Training System.

The Program Product can be used for any kind of training. However, the system is particularly useful in teaching those skills that involve new uses of terminals—for instance, a new online order entry application. People can be taught at times convenient to their work schedules and at their own pace, reducing or eliminating travel and classroom expenses.

The system can also conduct tests and keep records of the student's progress. And any company employee who knows a subject well can become the author of an Interactive Training System course. No programming experience is necessary.

At Celanese Corporation, for example, a new IBM data communications network made it necessary for terminal operators at 45 locations across the country to learn some radically different procedures. In just three weeks, all 200 operators had completed their computer-based courses and were productively employing their new skills.

"Other than the Interactive Training System, there was no practical way for us to train so many widely separated people in so short a time," says Harry Venable, corporate director of telecommunications services for Celanese at Charlotte, N.C. "The IBM 3275 terminals used for daily operations also access courses stored on our System/370 Model 165."

At the Shell Oil Company, twelve Interactive Training System courses used by the Shell Credit Card Center in Tulsa, Oklahoma were written by senior analyst Genevieve Moffat.

"Students are generally helped by the question-and-answer dialogues in the courses themselves," points out Ms. Moffat. "Those who run into difficulty can key in their own questions at their terminals. The questions then appear on my terminal and I enter answers which are transmitted back to the students." Some 300 employees have been trained at 222 terminals linked to a Model 158 at Tulsa.

Still another advantage of the system is the assurance that all students, at all locations, are being taught methods that are both current and uniform.

"Because our procedures change frequently, we found it difficult to keep an up-to-date procedure manual at all of our 16 Shell Chemical sales offices," says E. H. Covington, projects manager in Shell's Information Systems Department in Houston. "Now, with the Interactive Training System, we revise our courses as soon as changes occur, so they always reflect today's conditions."

With three Model 168s and one Model 158 at Houston, in addition to two System/370s at Tulsa, Information and Computer Services of Shell has responsibility for all of Shell's far-flung data processing operations. Dallas R. Wolf, general manager, sees the Interactive Training System as an important aid in implementing and maintaining online computer systems. He cites the instruction of oil and chemical personnel at 72 Shell locations nationwide.

"One of our major objectives is to give all Shell departments the greatest possible control over the entering, editing and accessing of their own data," he says. "We have found the Interactive Training System to be invaluable in teaching computer-oriented techniques at the same remote terminals employed for business operations.

"Both new and seasoned employees are benefiting from this versatile teaching aid. We will be making increasing use of it."



On-the-job training at the Shell Credit Card Center. Employees take Interactive Training System courses at the same IBM 3277 terminals they use for credit card transactions.

Union Mutual Accelerates Claims and Benefits Processing

"Now we can entirely bypass time-consuming key punching for data entry and error correction," says George Thomas as he talks of claims and benefits processing for group health and life insurance, as well as Medicare, at the Union Mutual Life Insurance Company in Portland, Maine.

Thomas is director of the company's computer center services. He points out that once a group or Medicare claim or benefit document reaches his division, it is processed that same day. This has been achieved without adding extra staff, even though Medicare transactions have grown by 50 percent and group insurance by 20 percent during the past two years.

The key to this accelerated claims processing speed at Union Mutual is an IBM 3886 optical character reader with the new "video collect" capability. The 3886 reads data from source documents directly to tape, thereby eliminating rekeying—one of the biggest workflow bottlenecks in data entry. What's more, with video collect, indistinct characters that the machine cannot read can be displayed for instant correction on a specially equipped 3277 terminal.

Thomas explains that source information is recorded on machine-readable documents, in Union Mutual field offices and at their Portland headquarters, in a combination of handprinted numbers and typed OCR-A font. The 3886 scans these documents and records the information on an IBM 3410 tape unit for later processing on a System/370 Model 145 running under DOS/VS.

If the 3886 cannot read a handprinted or typed character, the document is directed through the transport system to a special stacker. Later that day, all rejected documents are run through the 3886 again and displayed on the 3277. The operator corrects unreadable characters by keying the data to tape.

"Before we had the video collect capability," says systems analyst Peter Rutherford, "these corrections had to be key punched, and as a result they couldn't get into that night's processing cycle. This affected about 20 percent of our Medicare documents and some 10 percent of group transactions. Now we can be sure everything gets into the cycle the same day."

With the new method, Union Mutual has eliminated backlogs in both group and Medicare claims and benefits processing. As an example of this improvement in processing time, Thomas says, "Doctors and senior citizens in Maine are now receiving their Medicare checks three days sooner than before."



At an IBM 3277 terminal, an operator corrects a handprinted number which was previously rejected as unreadable by a 3886 optical character reader.

System/370...

(Continued from preceding page)

is now even stronger, and any revolutionary new system will be evolutionary from the user's point of view. Undoubtedly, System/370 will play a central role in the continuing evolution of data processing.

"A lot of time and effort has been and will continue to be spent by IBM in developing systems and systems products that will allow our customers to expand their use of data processing with minimum disruptive activity and reprogramming. I believe we must offer our customers the flexibility to choose their optimum systems approach free of the limitation of device support, geographic restrictions and programming talent. While much more complex systems will be a fact of life, those systems must manage that complexity effectively and make it as transparent to the user as possible. Systems to be successful will have to continue to provide service while building the function base for new capability and service to the end user."

DP Dialogue appears regularly in these pages. As its name suggests, we hope DP Dialogue will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

75-5

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Data Processing Division

COMMUNICATIONS

Use of SNA Won't End Non-IBM Options

By Ronald A. Frank
Of the CW Staff

SANTA CLARA, Calif. – Independent terminals and data communications subsystems will continue to be available to users when IBM's Systems Network Architecture (SNA) comes into widespread use.

This is the opinion of two data communications specialists at Memorex Corp. who believe the user will have options in both non-IBM hardware and software.

The entire SNA concept is based on a standard interface, and IBM "is vulnerable" whenever there is a common interconnection point, Bill Black, manager of communications product engineering, said.

"But users will have to look at the problem from [the standpoint of] their need to move data. And it will become a software as well as a hardware problem. The alternatives will be system alternatives rather than replacing individual terminals such as users do in today's networks," Lowell Sando, director of software development, said.

While the general-purpose terminal of today will continue to be available, there may be a new type of data communications equipment specifically designed to operate over certain types of lines and networks, Sando said.

As an example, Memorex is studying the equipment interface on the packet-switching Telenet network. And while there are no specific plans at the moment, Sando said a terminal tailored to take advantage of a packet-switched service would be a distinct possibility in the future.

As the user develops an increased need for higher speed lines, the carrier's line characteristics become more important to the capabilities of the terminals that are used on those lines, Sando said.

One of the major problems now facing users planning new data communications networks is the lack of detailed specifications about the SNA environment, Black said.

As a result, users who must get networks into operation decide to go with current network technology hoping to upgrade later as more details become available about SNA.

For these users, it is important that they select non-IBM terminal suppliers who will integrate Synchronous Data Link Control (SDLC) and other features into their equipment when the time comes. And the user should look for guarantees that the independent equipment will get additional capabilities, Black said.

The first SNA-compatible terminals will be available from non-IBM vendors within six to 18 months after IBM announces final specifications, Black predicted. The first compatible devices will be in the interactive low-speed applications.

After that, the more complicated buffered intelligent and batch devices will appear from non-IBM suppliers. And most of these units will fit into SNA networks to replace comparable IBM communications equipment, he said.

The most likely level at which compatible terminal systems will interface is at the terminal control unit, Sando said. It is at this point the user's data actually enters and leaves the network, he said.

Terminals used in these systems will have a common microprocessor as the core, and they will utilize a common line discipline such as SDLC or a similar full-duplex protocol, Sando predicted.

But added to these common features will be specialized capabilities that will adapt the terminal subsystems to specific environments.

There will be a "lack of migration" to the Network Control Program (NCP)/Virtual Telecommunications Access Method (Vtam) environment, Sando said.

It is not a simple process to convert to Vtam, and many users don't want to get all new terminals to operate under SNA. Inside IBM, Vtam development is slipping for about two years and today there are no announced users of Level 3 Vtam with NCP, Sando said.

Another serious problem for the user is that the 370 is not a good host device for communications, Black said. As presently structured under SNA, the user pays a high cost to have the host interact with the terminal processor.

The host should operate as independently as possible of the network operation, Black said.

Because of these limitations, it is likely IBM will introduce further enhancements for its 370X front ends, probably with more advanced memory technology for faster switching. Or a new front-end family will evolve from IBM before SNA is finalized for the user, the Memorex spokesmen said.

An example of the more intelligent front ends needed in future networks is the recently introduced Memorex 1380. It will be compatible with SDLC networks.

Meanwhile, the earlier 1270 terminal controller will continue to be available for more conventional applications.

The 1380 is a "soft front end" and it will offer a Vtam-compatible version of NCP as a later feature, Sando said. The expanded features will be implemented as software so users can upgrade as their networks become more complex, he said.

Telenet Asks FCC To Regulate Tymnet

WASHINGTON, D.C. – Telenet Communications Corp. has asked the Federal Communications Commission (FCC) to require that Tymshare, Inc. operate as a regulated common carrier.

Both firms currently offer packet-switched service to users, but Telenet operates as a tariffed carrier while Tymshare is nonregulated and provides its service under contracts with its customers [CW, Sept. 24].

In a complaint to the FCC asking that Tymshare be certified as a common carrier, Telenet said the Tymshare service goes beyond the provisions of AT&T's joint-use tariffs.

"The store-and-forward switching conducted by Tymshare's Tymnet for its data communications customers is a separate communications activity which cannot be legitimized" because AT&T allows the facilities to be jointly used by many customers, Telenet said.

"Tymshare is providing interstate and foreign communications service for hire, for profit," Telenet said.

An FCC staff spokesman said Tymshare would have to respond to the Telenet complaint before it can be determined what action will be taken.

The broad question of whether packet-switched services should be regulated or nonregulated is included in an FCC proceeding known as Docket 20097. It is not known when the FCC will reach a final decision on this docket.

Meanwhile, Telenet wants the commission to require that Tymshare operate under tariff as a regulated carrier.



CW Photo by R. Frank

Panorama of the Recent Tele-Communications Association Conference



The new 30 cps Terminal from AJ

Here's the *brand new* AJ 830, a 30 cps impact printer terminal that utilizes AJ's microprocessor control and the innovative "daisy" print wheel. The AJ 830 is ideal for interactive time sharing, information entry and retrieval, and point-to-point data exchange.

Some of the features of this great new terminal include:

- Throughput, high print quality, multiple copies
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- USACII/EBCD/Correspondence codes
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You also can get options such as forms tractors, pin-feed platens, and fan-fold paper shelves. There's even a 45 cps printer available for greater throughput.

There's more, too. AJ's nationwide sales and service organization stands behind every Model 830. And, you get your choice—purchase or lease (month-to-month if you wish).

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Low-Cost Unit From Tektronix Has Graphics, Alphanumerics

BEAVERTON, Ore. – Tektronix has introduced a low-priced graphics terminal which it said makes graphics available at a price normally charged for CRT alphanumeric devices.

Called the 4006-1, the terminal combines both graphics and alphanumerics at a basic cost below $3,000, according to Tektronix.

The 4006-1 is said to be compatible with "most mainframe computers," and it will be supported by the same graphic software available for Tektronix' earlier family of graphic terminals plus an Interactive Graphing Package.

Hard-copy compatibility is included in the 4006-1, using the Tektronix 4631 hard-copy unit. Off-line storage can be provided by the Tektronix 4923 digital cartridge tape recorder.

Data rates up to 4,800 bit/sec are available, with rates selectable in eight steps of 75-, 110-, 150-, 300-, 600-, 1,200-, 2,400- and 4,800 bit/sec. The 4006-1 has 1,024 by 780 viewable points.

Its screen capacity of 2,590 alphanumeric characters provides as much information as most CRTs that are only alphanumeric, the firm said.

The 4006-1 is compatible with EIA RS-232A, -B and -C (CCITT-V24) interfaces. An option for the 4006-1 is the half-duplex data communications module which extends the capability of the standard integral interface to include half-duplex normal and half-duplex with supervisory channel operation.

The 4006-1 allows communications between an operator and a CPU in either alphanumeric or graphic operation.

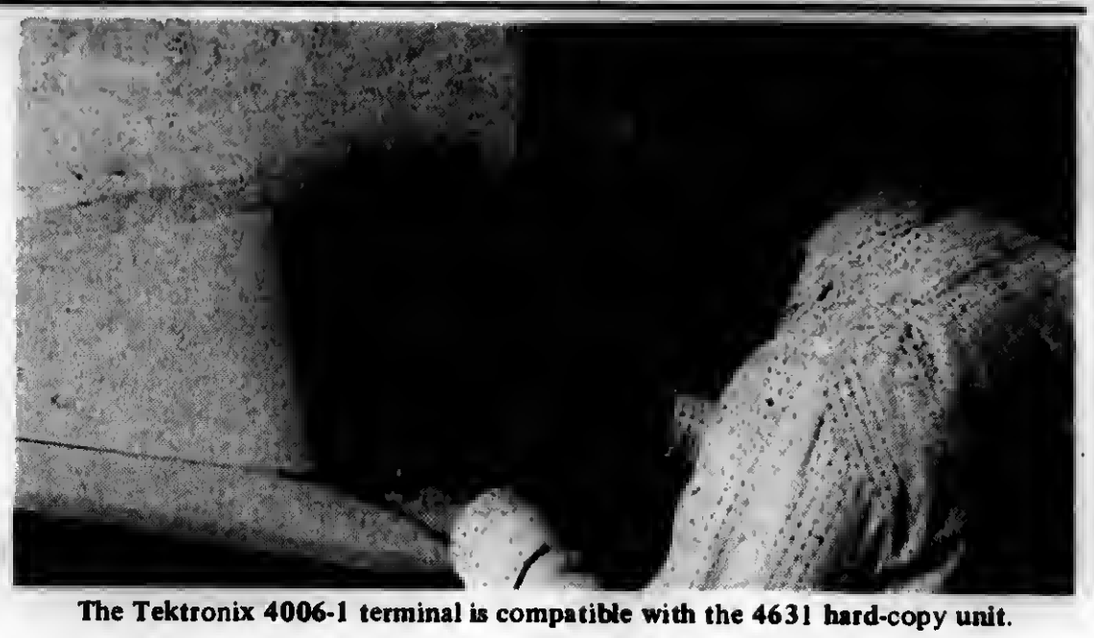
Data received by the terminal can be written or drawn on the display or can control other functions in the terminal.

The 4006-1 has two principal operating modes, Alpha (alphanumeric) and Graf (graphic display). Alpha mode permits receipt and display of alphanumeric data on the CRT. Graf mode controls input of data which causes vectors to be written on the display.

In the alpha mode, the 4006-1 will have a 5 by 7 dot matrix, 63 printing characters and 35 lines with at least 74 char./line.

In the Graf mode, it will have 1,024 by 1,024 addressable points, with 780 in the Y dimension viewable on the screen.

The 4006-1 provides continuous lines in the vector mode between any two selected points.



The Tektronix 4006-1 terminal is compatible with the 4631 hard-copy unit.

The Interactive Graphing Package reportedly enables the nonprogrammer to generate on-screen single and multiple line graphs, bar charts, log plots and calendar plots. Additional features of this package include automatic sealing and interactive labeling, the firm said.

The basic price for the 4006-1 is $2,995, with a lease price of $150/mo on a two-year lease. First deliveries are scheduled for October. The company address is Box 500, 97005.

Terminal Transactions

Transaction Device Available From CCC

BEDFORD, Mass. – Concord Computing Corp. (CCC) has introduced the 750 transaction terminal for financial transactions and check authorization at retail points of sale.

The terminal features an alphabetic and numeric printer capable of printing up to five lines with 31 char./line for recording transaction information on entry documents. It has a 10-key keyboard and nine programmable keys.

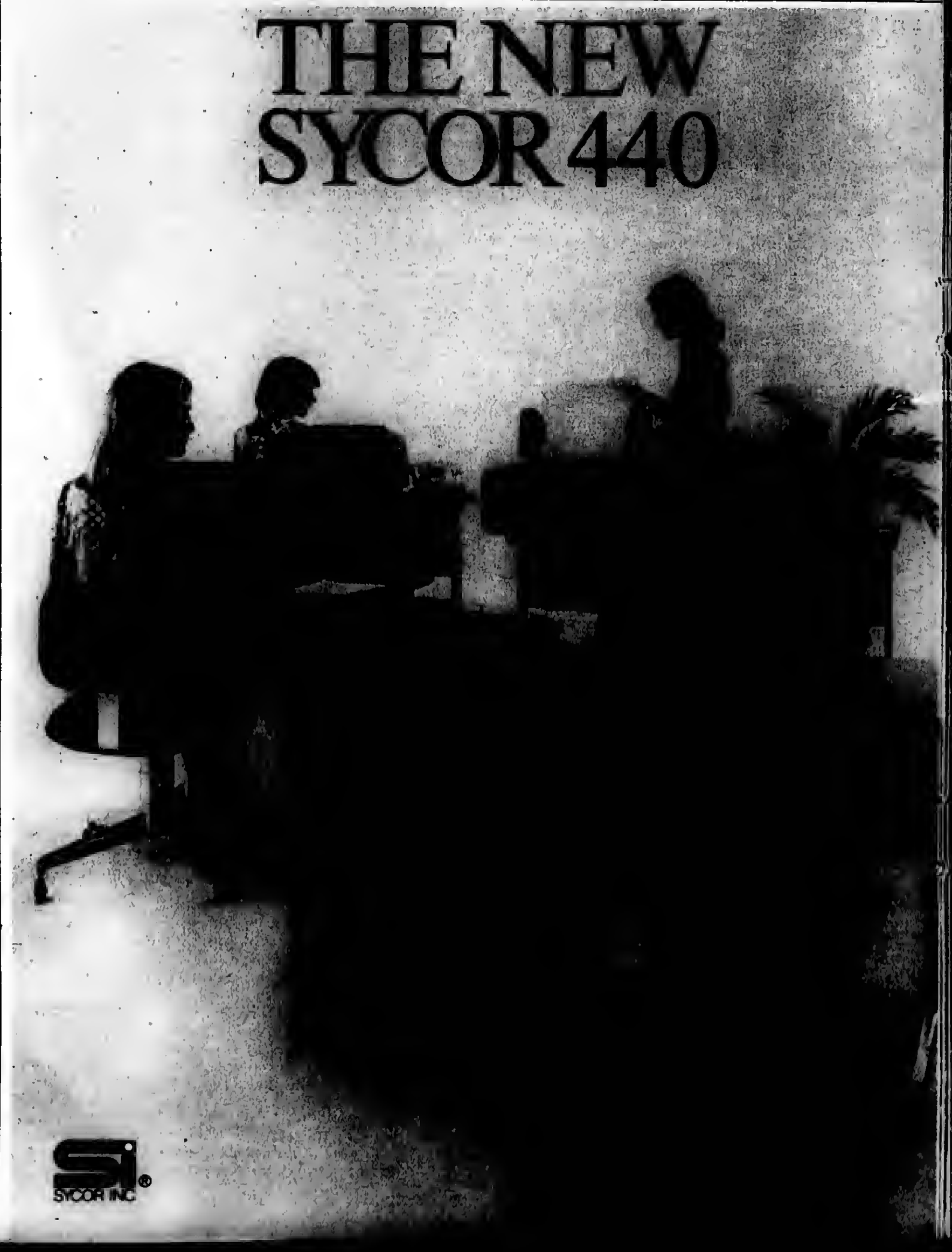
The terminal accepts standard magnetic stripe and embossed cards, according to a spokesman. Its microcomputer can be programmed to lead operators through transactions under the direction of a 12-position back-lit display.

The 750 can communicate directly with a CPU at speeds up to 1,200 bit/sec as an Ascii device or operate through a control unit which offers a high-speed binary synchronous communications interface.

The terminal costs $1,600 with first deliveries scheduled for January from the firm at 7 Alfred Circle, 01730.

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THE NEW SYCOR 440



SYCOR INC

Burroughs TT 602 Designed for Financial Applications

DETROIT – Burroughs Corp. has a transaction control terminal system, the TT 602, for banks and other financial institutions.

The terminal system has been designed for electronic funds transfer systems (EFTS), particularly those based on the use of magnetic credit and cash cards, but also accommodating other identification methods, a spokesman said.

The TT 602 has a keyboard/display module with a 16-position Panaplex display panel, a 12-key numeric keyboard, four basic functions keys plus special application keys and indicator lights.

This module is approximately the size of a desk-model electronic calculator. A separate module, which may be located up to eight feet away, contains the terminal's memory, power supply, logic, data set and data communications processor, Burroughs said.

The terminal may be equipped with either of two magnetic card-reading devices. The first device reads track two of a magnetic striped card as adopted by the American Bankers Association or track three as specified by the thrift industry.

The second device reads track three and records new information on the track as a transaction is completed.

An optional, hand-held keyboard allows the card holder to index a personal secret identification number to verify that he is an authorized user of that card.

Each TT 602 contains a microprocessor utilizing large-scale integrated circuitry. The terminals can communicate directly to a central computer or to a local or remote system and communications processor, the vendor said.

The TT 602 can have a 150-digit or 256-digit buffer for receiving data or for storing data prior to transmission. A "paging" key allows the operator to display stored data fields sequentially to verify or correct data prior to transmission.

Similarly, it will display data received by the terminal from the central computer. The TT 602 guides and controls the terminal operator as data is entered into the terminal, the company said.

Terminal Transactions

Confidence Test Routine

Another feature of the TT 602 is a self-contained confidence test routine that is activated automatically when the terminal is turned on. This routine quickly checks all the terminal circuitry and reports the terminal's status on the display panel.

The TT 602 has transmission speeds ranging from 75- to 1,800 bit/sec and operates asynchronously in half-duplex mode. Either internal or external data sets may be used.

The network environment can include two-wire dial-up lines, four-wire leased lines with or without dial-up capability or direct connection to a central computer or local system and communications processor.

First deliveries of the TT 602 are scheduled to begin in the second quarter. Purchase prices for the basic system start at $990.

Hard Copy Optional On DEC Graphics Unit

MARLBOROUGH, Mass. – An interactive graphics terminal with optional integrated hard-copy output unit is available from Digital Equipment Corp.

The video-display terminal, called the VT55 Decgraphic scope, is designed for compatibility with "any computer processor," the vendor said.

The VT55 is intended for such tasks as plotting histograms, waveform and peak analyses, data display, monitoring and trending. The terminal will also have applications in network-oriented data base systems, the firm said.

Based on the VT50 Decscope, the VT55 provides interactive graphics with up to 1,024 data points, 512 by 256 resolution. Graphic cursors can be used for marking portions of a graph. Horizontal and vertical lines can be displayed for constructing background grids.

Incorporating an Ansi-standard keyboard, the VT55 graphics terminal provides 24 lines of 80 characters, editing cursor and standard Ascii communications at up to 9,600 bit/sec.

The optional hard-copy unit, at a price of $800, copies both text and graphic screen contents on electrolytic paper in 25 seconds, either by depression of the auto print key or under control of the host computer, the firm said.

The VT55 costs $2,495 with first deliveries scheduled for November.

Communications Adapter Enhances Greyhound System

PHOENIX – Greyhound Computer Corp. has introduced the Integrated Communications Adapter (ICA), an enhancement for its 360/30 systems.

The ICA provides the 360 user with a single synchronous communications line which is equivalent to the IBM 2701 with a 7698 Type II synchronous data adapter, an external clock with 2,400- to 9,600 bit/sec, 9060 Ebcdic code and 8029 transparency.

A transparency switch isolates the ICA from the CPU, allowing manufacturer maintenance on the mainframe.

The ICA is available as part of a Greyhound Phoenix 360/30 system. The rental rate is $250/mo, including minimum monthly maintenance, on a three-year lease, Greyhound said from Greyhound Tower, 85077.

Clustered data entry and concurrent processing with shared files...$677 a month.

The Sycor 440 System: the newest addition to our family of compatible intelligent terminals.

Our new distributed processing system lets you perform data entry and inquiry/response concurrent with background processing. So you don't need multiple systems to do multiple jobs. At $677 a month (for four keyboards, communications, cassette, and a five mb disk on a three year lease, with maintenance) you can perform all these functions—plus many more you never thought possible at such a low price.

Intelligent data entry.

You can save time and money by catching operator errors as they happen, prior to transmission to the central computer site. And reduced errors mean greater operator productivity, lower communication costs and reduced mainframe processing.

Field editing. As soon as you get the system, you can implement our basic data entry package. Without any fancy programming.

TAL II. To extend the 440's power, use our new data entry language, TAL II. This easy-to-use, high-level language lets you customize data entry programs. Instructions are also provided for arithmetic operations, conditional data entry, range checking, table look-up, equal/compare and a host of other intelligent features.

Shared file access.

The 440 system lets you share and access files locally, reducing investments in telephone communications and central CPU resources.

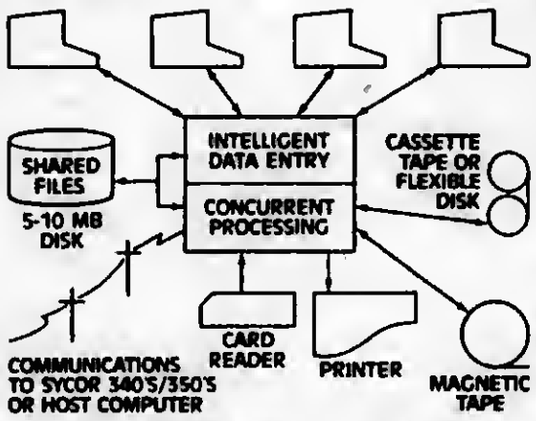
Data entry made easy. Now each operator, at her own display, can make use of current data in shared files to support data entry functions. For reduced keystrokes and lower error rates.

Inquiry/Response. File look-up is made simple with up-to-date information on-site, using the 440's own file management and disk storage capabilities.

System modularity.

Design your own system with a variety of options and peripherals.

Supports from 1 to 8 displays. Each is controlled by the Sycor processor and is capable of performing tasks independent of other displays.



Choice of 5 and 10mb disks. Store and retrieve programs, shared files, and data at remote locations.

Wide variety of peripherals. And to complete our system configuration, choose from matrix and line printers, computer-compatible tape drives, card readers, and a variety of communications options.

Compatibility.

There's full software compatibility with our Model 340 and 350 stand-alone terminals. Keyboards are also compatible.

Programming. One program fits three different systems—340, 350 and 440.

Communications. Communicate with the mainframe, emulating IBM 2770, 2780 or 3780 protocols. Or use the 440 as a polling station at your central computer site to receive and transmit data to remote 340s, 350s, and 440s.

Concurrent processing.

And best of all, while data entry is being performed in the foreground, you can be doing other jobs concurrently in the background. Jobs that can save you time and money. Jobs like:

Remote job entry. Use the 440 with its card reader and 300 LPM printer for large-scale remote job entry. And since the system contains a CRT and a keyboard, you don't pay extra for them.

Multi-terminal printer support. Each display can interleave print data to one printer as the data is being entered. So, you don't need a separate printer for each display.

Report generation. Sycor-provided programs let you produce all sorts of management reports—sales analysis, inventory, or billing—at the same time as you are performing data entry.

File maintenance. And the Sycor 440 allows you to do editing, sorting, updating, and file transfer in a background operation.

The lowest-priced distributed processing system.

When you consider all the advantages of our 440 system, and then consider its low monthly cost, we think you'll agree: it's the best system in the industry.

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CONVERSE MEETING

Users of CONVERSE tele-communication executive software will be organizing a CONVERSE User Group on Nov. 3-4, 1975. If you are interested in exchanging information with other CONVERSE installations please contact:

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P.O. Box 11368
Salt Lake City, Utah 84139
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Computing Power Through an RJE Terminal



Through a Remote Job Entry terminal, you can utilize the power of Martin Marietta Data Systems' IBM 370/168 computers. The RJE approach offers some out-of-the-ordinary benefits for the company thinking of enhancing or acquiring a computer:

As Convenient as an In-House Machine

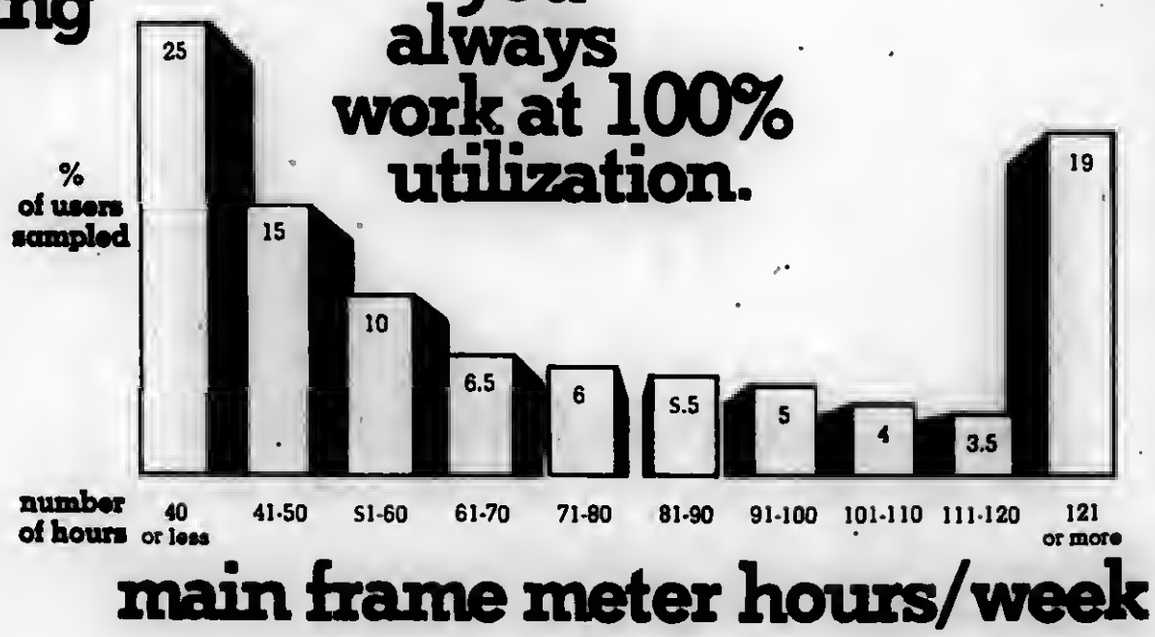
You handle the on-site RJE terminal card readers and printers just as you would your own machine. You can use video display keyboards instead, add tapes or use a small IBM computer at the terminal location. You get as much local processing as you want — batch or interactive — with planned overflow back to the MMDS computer centers. The connection is by way of the MMDS network, intermixing high and low speed data on high speed duplex lines. The network simplifies the handling of data processing for the decentralized company. The complex of large computers and high speed lines afford economies of scale and reliability.

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The Elastic Configuration

A company's data processing load fluctuates from hour to hour, day to day, and week to week. The average computer, configured for the worst situation, is under half loaded. Not only does the load fluctuate; the configuration requirements change. A hidden source of under-utilization is the capacity (memory size, channels, line handling capability and peripheral devices) that exists to handle only exceptional jobs. When buying computer power through RJE terminal facilities, you always work at 100% utilization and your configuration is always the minimum required. Additionally, for those peak days or that exceptional program, you have at your disposal all the power and equipment you need. A modest in-house configuration handling your consistent volume, coupled with an RJE terminal for exceptional loads and job profiles, is often a happy combination.

you always work at 100% utilization.



A Technological Umbrella

For hardware reasons, a company may elect to handle part or all of its load through an RJE arrangement; developing additional systems or implementing its new strategy on the MMDS facility. This is a simple, flexible and economical way to move forward. The same case applies for the technology. MMDS has 50 technical development people working in the VS, TSO, IMS, CRJE and communications areas. The software environment they create and enhance is used by our clients, by us and by our parent company. It has to be effective and it has to be up-to-date. The use of an RJE terminal not only smooths load and configuration requirements for the in-house computer owner; it taps into up-to-date hardware, communications and systems software. It is a flexible, fully supported means of developing the company's computing plan without the normal hardware shuffling and software R&D.

capabilities snapshot

HARDWARE
MAIN FRAMES:
370/168's 360/50
370/145 CDC 6500
370/155 EAI 8400
DISKS:
2314, 3330-single and double density
Drums, Magnetic Tapes, Plotters, Microfilm

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TSO DMS DBOMP
SVS/HASP
OS/MVT/HASP
DOS DOS/VS
Emulation Assembler
COBOL-ANS FORTRAN
PL/I RPG SNOBOL
Application Software
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Complete Flexibility Into the Future

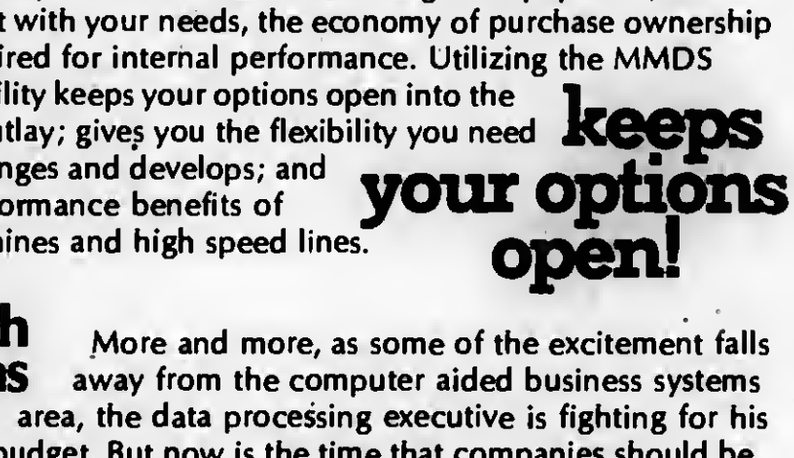
You may be doing a lot of batch work now but be planning for conversion to real-time processing. Or your loads may be planned to move sharply. Perhaps you're centralizing or decentralizing your data processing arrangements. Owning your own equipment can be a considerable constraint in implementing your plans and renting equipment is expensive. In any case, continued shuffling of hardware is an unwelcome intrustion on management's time. To get the best price performance from IBM, you need the latest (and largest) equipment, but this may be in conflict with your needs, the economy of purchase ownership and the stability required for internal performance. Utilizing the MMDS computer/network utility keeps your options open into the future; avoids cash outlay; gives you the flexibility you need as your operation changes and develops; and affords the price performance benefits of large purchased machines and high speed lines.

keeps your options open!

Releases Cash for Systems Development

More and more, as some of the excitement falls away from the computer aided business systems area, the data processing executive is fighting for his budget. But now is the time that companies should be putting major effort into systems development: the software environment, the cost of computing equipment and the systems philosophy of interactive computing (with data base organization and distributive processing) are all coming together into a practicable technology for business systems implementation. Many computer set-ups, though, are locked into depreciated hardware and heavy on-going maintenance loads. Satisfying some or all of your computer power needs through terminal facilities can release significant cash for the system development budget. You don't have the same money tied up in hardware; you don't have the software technology R&D load; you get the economy of 100% machine and configuration utilization; and you get the economy of scale inherent in larger, up-to-date machines and faster lines.

30% cash savings!



Example of in-house versus remote job entry computing costs.

Free Off-the-Shelf Systems

MMDS has been a pioneer in the field of off-the-shelf Modular Application Systems (MAS) development. Where relevant, MAS can be tailored to fit your exact needs; the systems are straight-forward and efficient to use; and their performance is proven in over 500 implementations. A special feature of the MMDS RJE terminal service is that these MAS systems are available at no cost for use on the MMDS computer/network facility (for use on a client's own computer, the cost works out at 10% to 20% of the estimated cost of in-house development depending on the amount of tailoring). Additionally, the convenience of handling a particular system (say, MAS Inventory Management or an IMS application) on a dedicated RJE facility — alongside the existing in-house machinery or networked into a remote subsidiary — is worthy of note. Again, this use of the RJE terminal facility unlocks the economies of utilization and scale as well as hardware flexibility into the future and the benefit of the technological umbrella. MAS, for example, is in use with IMS and other proprietary data management systems with facilities available for interactive processing.

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Martin Marietta Data Systems builds and runs computer systems: custom systems and off-the shelf MAS. Our emphasis is on providing well thought-out products and services in a reliable and economic fashion. Our RJE terminal service, the 370/168 computer centers and linking network, and the MAS product ranges are all directed to this end. We seek the best people in the computer services industry and we provide them the tools with which to do an efficient job. These software tools and methodologies are proven commercial successes in their own right — SDM, a Systems Development Methodology; Testmaster, a modular programming test harness; Tablemaster, for decision table processing; and HSLI, a systems analysis language.

For more information on our computer power services, MAS ranges, or systems and programming capabilities, please contact:

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New York Region ..... Mr. John Bately
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Great Lakes Region ..... Mr. James E. Feely
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Graphics Display Unit Aids Tire Design

AKRON, Ohio -- An interactive graphics display system enables engineers at the Firestone Tire and Rubber Co. to design tire treads faster than manual methods.

The 900/2250 graphic emulation system from Sanders Associates, Inc. includes two 21-in. display consoles with keyboards and light pens. It allows design engineers to utilize existing IBM 2250 software with the added feature of remote operation miles away from the central IBM 370 mainframe at Firestone's DP center.

Using the keyboards, operators call up a library of available design programs and select one with a light pen.

Tire groove lines are plotted by touching the light pen to the screen at the desired locations. Design lines are generated by the CPU and the process is continued through design of "sipes," which are small slots between grooves and tire elements – the protruding rubber of the tread.

The elements, which have varying pitch lengths for noise control, are computed by the system and displayed on the screen.

The displays are also used to depict cross sections of the tires. Because tire molds are made for inflated tires, the system simulates inflation under various pressures and depicts the outline on the screen.



Firestone design engineer John Becker measures tread elements on a prototype tire. The treads are designed on a graphics display system.

When the design is complete, the information is transmitted to the mainframe, which then directs a local plotter to print out a hard copy from which a template, or mold, can be designed.

Thomas Conner, manager of the Development Computer Operation at Firestone, said the system, in addition to its remote capabilities, enables scaling and translating functions to be performed locally, eliminating host CPU intervention.

"It not only provides greater graphic capabilities and enables us to utilize existing IBM 2250 software, it also provides a steadier image because of the refresh rate," he added.

ISU Meeting to Cover Data Communications

AMES, Iowa – A data communications conference covering principles and applications is scheduled Oct. 20-30 at Iowa State University (ISU).

Sponsored by the Engineering Extension Service of ISU and the U.S. Independent Telephone Association, the conference will help participants obtain the basic concepts and vocabulary of data communications, a spokesman said.

Sessions will cover effective use of computer-communications interfaces, error detection and correction, voiceband synchronous data sets, wideband data sets and analog data sets. Laboratory sessions will use low-, medium- and high-speed data sets and peripheral and test gear.

The registration fee is $700 and additional information may be obtained from Richard Horton, 306C Coover Hall, ISU, 50011.

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the industry's lowest-priced portable terminal!



Buy a brand new machine for as little as $1995. Rent it for as low as $65 monthly, including maintenance by NCR. Or take a lease/purchase plan. Any way, it's unbeatable!

Now, you can have it all together – the convenience of a portable . . . reliability . . . and down-to-earth prices. In addition, our 265 Portable 30 cps KSR Terminal gives you a choice of standard or new switchable APL/ASCII keyboard.

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NEW SWITCHABLE KEYBOARD MODELS offer comparable savings. Single unit rentals run from $130 down to $90 monthly, including NCR maintenance. Single unit purchase price is $2495. Quantity discounts are available under both plans. Lease/purchase plans run from $125 down to $70 monthly.

Standard or switcheble, DDI 265 is an exceptionally reliable terminal with a quiet thermal printer. Its design dissipates heat so effectively no fan is needed, and it's the only portable with U.L. approval.

What if you need a terminal other than a portable? You still save with DOI. As one of the nation's largest suppliers of data communications equipment, we seek out the best buys in terminals and modems of all types – and offer you a choice to best serve your needs and budget! Try us.

For more information, write: Data Dimensions, Inc., 51 Weaver Street, Greenwich, Conn. 06830. Or better yet, call Bob Loonin at (203) 661-1700.

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Authentic information is freely available WITHOUT CHARGE from the Australian Embassy in Washington, D.C. (202) 797-3000, and the Australian Consulate General in New York (212) 245-4000, San Francisco (415) 362-6160, Los Angeles (213) 380-4610 and Chicago (312) 329-1740.

On-Line Authorization Terminals Let Shoppers Charge Groceries

EL SEGUNDO, Calif. – A local supermarket is said to be one of the first to allow the use of Master Charge credit cards for grocery purchases through on-line credit authorization terminals.

Gelson's, which operates five supermarkets in the Los Angeles area, has installed Model 1131 Data Source Corp. credit authorization terminals.

When a Master Charge card is inserted into the terminal, the CPU reportedly responds within seven seconds, giving visual instructions to the clerk. This is said to eliminate customer delay and make it feasible to verify credit for various sizes of purchases.

Gelson's feels this installation may lead to other electronic funds transfer services such as check guarantee, debit card or savings withdrawal.

The Master Charge accounts are handled for Gelson's by First Los Angeles Bank in Century City.

Joseph J. Digange, president of First Los Angeles Bank, said that because of the terminals' speed and control, the bank obtained both an account and the ability to build customer acceptance of electronic fund transfer activities.

Thomas J. Kempf, executive vice-president of the bank, pointed out Gelson's is the Western States Bankcard Association's (WSBA) first terminal user in the grocery store environment and also the first installation that provides terminals at each check-out location.

WSBA said it has installed nearly 500 Data Source terminals with two Data General Nova minicomputer systems in southern California and the San Francisco Bay area during the past two years. Among the member banks using the terminals are Crocker, Security Pacific, United California and Wells Fargo.



Gelson's is reportedly the first supermarket that allows shoppers to use credit cards to pay for groceries.

APL/Ascii Available With Datamedia CRT

PENNSAUKEN, N.J. – Datamedia Corp. has announced the availability of an APL/Ascii switch-selectable version of its Elite 1520A video terminal.

The terminal includes APL overstrike capability and underlining. Backspace through to previous line is standard, and horizontal tabulation operates in eight-character increments.

The terminal operates in a conversational mode and displays 1,920 characters in a 24-line by 80-character format.

Other features include a 128-character set, high resolution display, dual data rates to 9,600 bit/sec RS-232 interface (20mA current loop optional), a printer interface and composite video output.

The Elite 1520A APL/Ascii is priced at $2,200. Delivery is 60 days from 7300 N. Crescent Blvd., 08110.

Bunker Ramo Reduces Price Of Model 730 Cash Register

BOSTON – Bunker Ramo has announced a price reduction on its Model 730 electronic cash register.

During the changeover to the Model 740, the Electronic Store Information System (Esis), a typical 10-lane supermarket system, including the recently announced System 3000 data base, will cost $37,250.

The same system would earlier have been priced at $51,000, according to a company spokesman. On a per-register basis, the savings amounts to $1,375.

The lower prices will prevail from now through Dec. 15 on systems ordered for installation before June 30, the firm said.

The current Model 730 is compatible with the Model 740, Bunker Ramo said.

The firm is at Nutmeg Drive, 06609.

See What MINI Is Up To

"Up" is precisely the word for what's happening with mini-computers. They have invaded the commercial sector, taking on a substantial part of the data processing responsibility.

It's a trend worth examining. Data Processing Management Association, N.Y. Chapter, will do so, sponsoring two seminars in October and November, with programs provided by Mini-Computer Systems, Inc.

Everyone associated with data processing, whether member of DPMA or not, whether directly or indirectly involved, should consider attending.

What the mini is up to is enough to startle you.

Thursday, Oct. 23 & Nov. 20, 1975 — 3-5 p.m.
Hotel Biltmore, Madison Avenue & 43rd Street, N.Y.
Suites G-H-I, First Floor

$20 each seminar, cocktail hour & dinner

$10 each seminar & cocktail hour

DPMA

To: Data Processing Management Association
New York Chapter, Inc.
P.O. Box 1406 F.D.R. Station
New York, N.Y. 10022

Please reserve my seat for Oct. 23 seminar on mini-computers. Enclosed is payment of

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(Make checks payable to DPMA, New York Chapter, Inc.)

Why Crime Pays Less Than Ever In Lake County, Illinois:

INCOTERM



In an inflationary economy, it's nice to see someone holding the line on the wages of sin.

That's what they're doing at the Lake County Sheriff's Office. With a little help from INCOTERM.

A powerful INCOTERM SPD® 10/20 Intelligent Display terminal serves as controller for 50-odd mobile teleprinters in local and county police cars covering nearly 500 square miles of northern Illinois.

The officers on the road call in verbal reports and [illegible] responses right in the [illegible] police can receive such [illegible] no fear of unauthorized [illegible]

At the [illegible] the Illinois [illegible]

Even if a suspect is seated in the cruiser beside the officer when the return message comes in, INCOTERM screens the information in the station house first to permit the encoding of data critical to the officer's safety.

And it does all this while cutting typical transmission times in half. Plus... the built-in INCOTERM memory lets the officer in the car interrupt incoming messages for emergency voice transmission—without missing a word.

INCOTERM.
More Power
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For a low $2495, Digital's VT55 Graphics Terminal reaches new heights.

Digital announces the VT55 Graphics Terminal. For use with anyone's computer. To handle a variety of applications more productively through the addition of graphics capability. With optional hard copy output. At a unit price as low as $2495.

Use the VT55 for plotting histograms, waveform and peak analyses, data acquisition, monitoring, trending, simulation, laboratory charts and forms, or wherever your applications can be improved through graphics.

Automatic, upward line scrolling enables continuous data entry. Graphic cursors facilitate data editing and graph generation, with x-y plotting (2 values of y for each x) of two 512-point graphs.

Hard copy for either text or graphics display can be generated by an electrolytic copier that can be integrated in the terminal.

A full keyboard offers the complete ASCII character set displayable in as many as 24, 80-character lines.

Terminal-to-computer communications speeds are variable up to a fast 960 characters per second.

The $2495 graphics terminal from Digital. A new high for video display capability at a new low for graphics cost.

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But Can Software Keep Up?

Hardware Progress Opening Door to New DP Concepts

By Patrick Ward
Of the CW Staff

WASHINGTON, D.C. – Recent innovations in hardware – semiconductor memory, standardized circuits and large, fast mass storage – may bring hierarchical computer networks and integrated data management systems out of the research labs and into commercial DP within the next decade.

But it remains for the software developers to utilize the potential of these hardware developments, Patrick J. Martin, special assistant to the secretary of administration in the U.S. Department of Agriculture, told a recent conference here.

The growing use of semiconductor memory, standard computer circuits and large, low-speed on-line storage as well as the increases in disk capacity are continuing trends that have been evident in the industry for years, Martin said:

The cost to execute instructions and the cost and access time of data storage have been continuously falling, he added.

As mass storage, bubble memory and charge-coupled devices find their way into the marketplace, they will reinforce this trend, he said, predicting the next 10 years will see the cost of computation and storage fall while speeds and capacities increase.

'Building Boxes'

Because the costs of circuit design will continue to be high, manufacturers will be forced to use standard components. Standard hardware "building" boxes will appear that will be able to function as control arithmetic, I/O or communications processors – depending on their microcoded stored logic.

Thus a computer system could be assembled from these blocks, with as many arithmetic processors or I/O or communications processors as the user deemed appropriate.

"A system would grow by simply renting additional boxes and installing the appropriate microcode," Martin said.

The same boxes could go into intelligent terminals or satellite computers. Low-cost computation may no longer be a function of the economy of scale, and the need for centralized computer sites may come under attack, Martin said.

One interpretation, then, is that computer power may become as widely distributed as typewriters and the need for computer centers will vanish, he said.

But there are reasons to take another view, Martin said.

Large storage capability is one: "By 1985, the potential to access trillions of words of data will exist. Thus the concept of integrated management information systems will in fact be achievable," he said.

Central sites could also revert to parallel processing using one building block processor for a specific task.

"A processor could, for example, be dedicated to an inventory control or market research application which is constantly monitoring a data base," he said.

"Finally, reliability may dictate keeping the processors in a few centers. If a critical box fails, another can perform its tasks by changing its microcode."

The hierarchical computer network is a third alternative between decentralization and centralization, Martin said.

In this approach, large central data centers would tie into the computers in small regional centers. District centers would be linked with the regional centers and office processors would communicate with the district centers.

Hierarchical networks would give the user "the flexibility for centralized data bases, distributed data bases and both centralized and distributed processing," Martin observed.

"How well we can exploit these technological advances rests with the software developers," he added.

Hardware developments will necessarily affect software design, Martin said. Data base management systems will require an operating system of their own under the new hardware technology, he predicted.

Such a data management supervisor "would schedule requests to the data base and communicate with data management supervisors on other machines to either initiate or respond to information requests," he said.

Because of the hierarchical storage philosophy of future systems, "the programming languages in the next 10 years will be file-independent," Martin said.

"While Cobol, PL/1 and other procedure-oriented languages will still exist, more nonprocedural, higher level, user-oriented languages will appear," he said.

Although many current operating system functions will be done in hardware in he future, "scheduling will still be a major concern of the operating system," he forecast.

Users Making Upgrade Decisions Urged to Plan, Measure Capacity Needs, Spurn Flashy Technology

By Toni Wiseman
Of the CW Staff

BOSTON – Systems and applications growth are what should lead to hardware changes. Switching for the sake of technology alone is expensive and foolish.

This is the advice Don MacKinnon, DP director for Star Market Co., gave attendees at a session on "cost-effective hardware selection" at a recent conference here.

"Better planning will help us make better decisions. This sounds very simple but good planning is not easy to do," he said.

"DP has historically been a reactionary field. Someone wants something done and we work on it. We sign six-year leases without knowing what's down the road in the next six months, let alone six years," MacKinnon said.

DP should have its own long-range game plan, he said. This plan should be in concert with the company's overall plans and should have management support behind it.

Planning Tools

MacKinnon outlined some of the tools he uses to help plan application and hardware changes, working from the premise that "the DP manager cannot plan in a vacuum."

A steering committee ought to be formed, he said. The frequency of the meetings is not important, but the help and input from the users and management are.

"All project requests must be in writing," MacKinnon said. This is a way to provide good backup and documentation as to where the efforts of the DP staff have gone.

"You can go back and see what percentage of systems and programming time is spent on maintenance and on what system," he noted.

MacKinnon also suggested the use of a graph to determine at a glance CPU hours used. A one-page graph allows the DP manager to see the last two or three years, to spot trends and to project future growth, he said.

Another form of this information can be useful in projecting changes in shift coverage or hardware upgrades, he said.

"You simply take your existing base usage of CPU hours, apply a factor for growth and slot in your projected figures for new applications," MacKinnon said.

"This allows you to see where you are heading. You are now planning for change rather than reacting to it," he said.

Financing Alternatives

What are the financing alternatives in acquiring hardware?

Equipment can be rented from the vendor and paid for on a month-to-month basis. The major advantage of this method is flexibility, MacKinnon said.

There is also no capital investment, and rented machines are usually covered by a full maintenance agreement.

On the other hand, the user ends up paying a higher price, he said, and, since renting is a month-to-month proposition, there is no protection from price increases by the vendor.

"An alternative to renting hardware is to enter into a lease agreement," he said.

"There are literally hundreds if not thousands of leasing companies and brokers who will wheel and deal to tailor a lease to the needs of the customer.

"The whole crux of leasing is that, since the customer is committing himself for a period of time, he will get a reduction in the regular monthly rental. The longer the commitment, the greater the savings," he said.

The company also has the option of buying, of course, he said.

"The message is quite clear. If you want protection from product obsolescence, don't purchase.

"On the other hand, if the hardware will handle your requirements for the next five to seven years, buying may be the right decision, providing your company considers the capital investment a good one," MacKinnon concluded.

DEC Unveils Two Systems for Interactive Design

MARLBOROUGH, Mass. – Digital Equipment Corp. has announced a family of computer systems for interactive design engineering and production.

Called Decdesign systems, the units are built around the recently announced XVM medium-scale and large-scale Decsystem-1080 CPUs.



The Decdesign System 3000, which incorporates Digital Equipment Corp.'a medium-scale XVM computer, is said to be a totally integrated system for interactive solutions to complex design problems. Another syatem, the Decdesign System 1080, is built around DEC's large-scale Decsystem 10.

Two basic Decdesign configurations are available: the Decdesign 3000, a unit incorporating the XVM computer as a stand-alone system, and the Decdesign 1080, which employs both the XVM and Decsystem-10.

The systems are intended for use in interactive design problems of a complex nature such as printed circuit design, architectural design, facilities planning, cartography, mesh and stress analysis, factory layout, land planning and graphically oriented, user-developed applications, DEC said.

Up to Four Workstationa

DEC expects the Decdesign 3000 to be configured normally with two interactive graphics workstations, but noted it is available with from one to four workstations.

Each workstation includes a CRT, graphics processor, light pen and writing tablet. The system incorporates two general-purpose processors, disk-storage, a keyboard printer, an electrostatic printer/plotter and 9-track magnetic tape.

Software for the unit includes the XVM/RSX operating system and application aids. Though a stand-alone system, the Decdesign 3000 can be tied to larger computers through communications interfaces, DEC said.

The Decdesign 1080 incorporates two XVM graphics systems as satellites to a large-scale Decsystem-1080. Each satellite is a dual-processor system equivalent to that found in the Decdesign 3000, the vendor said.

Priced from about $4,000/mo for a five-year lease purchase of a typical Decdesign 3000 and from about $30,000/mo for a typical Decdesign 1080, the systems are scheduled for 90- and 150-day deliveries respectively.

Xerox Reprices 1200

EL SUGUNDO, Calif. – Xerox Corp. has announced three new pricing schedules for the 1200 computer printing system.

They replace a single lease price plan in effect since the 1200 was introduced in May 1973.

The new prices will result in a savings for most customers, depending on volume and terms, Xerox said.

The lease prices were effective for new orders on Oct. 1. Current 1200 system customers have until Nov. 1 to change over to the new schedules.

Xerox is at 701 S. Aviation Blvd., 90245.

BASF Winchester.



Now you can get the 3348, or "Winchester," Data Module, with all the quality and error-free performance that the name BASF implies . . . and at a competitive price.

The "Winchester" Data Module is a completely self-contained unit, incorporating heads, spindle, and recording surfaces in a protective factory-sealed pack. You've heard of the advantages of this new technology . . . complete security from environmental contamination, improved high-density storage, and incredibly fast access. Now you can enjoy this premium performance without paying a premium price.

Here are the facts, in brief: • Complete compatibility with 3340 drives • BASF-guaranteed Zero-Error performance • Now available in two configurations. . . . The 1335 Module, with 35 million-byte capacity, and the 1370 Module, with 70 million-byte capacity • Our 1370F Module, with fixed head and quicker access, will be available later.

For complete details on the BASF "Winchester" Data Module, write: BASF Systems, Crosby Drive, Bedford, MA 01730, or call our nearest regional office . . . in **Los Angeles,** (213) 451-8781; in **Chicago,** (312) 343-6618; and **Clifton, N.J.** (201) 473-8424.

You're already paying for BASF quality. . .you might as well have it.

For Frozen Food Firm

System Gets Right Product to Right Place on Time

BUFFALO, N.Y. – A frozen food firm here is leaning heavily on a newly installed computer system to achieve its objective of having the right product at the right place at the right time.

Rich Products Corp. is depending on the system to play a major role in all phases of the firm's operations, William E. Meyers, vice-president of management services, said.

Forecasting sales trends and optimizing distribution will be two of the key applications for the Univac 90/60 system so Rich Products can better serve its 125 brokers, 4,000 customers and field sales force in the U.S. and Canada.

The company's revenues for the current fiscal year are expected to top the $100 million mark. This represents a 100% growth in six years.

To keep up with this pace of growth in a competitive industry, the company has been engaged in a vigorous acquisition program, adding new facilities and capabilities to its existing base.

Rich Products experience in data processing dates back to 1962 when the company installed its first computer, an IBM 1401. In 1967 this system was upgraded to two IBM 360/30 computers.

Growth Leads to Purchase

The demands of continuous growth necessitated the purchase this year of the more powerful 90/60 system.

"We were just running out of steam with our existing computers," Meyers explained.

"Our business was growing so fast our DP resources were falling further and further behind our needs.

"With our new system we've got the raw horsepower to do the things we've had in the embryonic stage for some time," he said.

"We can now utilize multiprocessing and data communication capabilities to give our brokers a better reporting service; improve our production, inventory and distribution control; and, in general, obtain a much better handle on our day-to-day operations to the overall benefit of our customers."

Installed in April, the system has a 256K-byte main memory, four Uniservo 16 tape drives, two 8430 disk units with a total storage capacity of 200M bytes, a high-speed printer and a card punch.

Customer and product data is kept on the disk drives and historical sales data on magnetic tape.

The 90/60 runs under Univac's VS-9 operating system. Programs previously run on the IBM 360/30 systems have been gradually converted to run on the 90/60 without disrupting the company's normal day-to-day computer operations.

To date, programs converted encompass accounts receivable, order entry, raw material inventory, payroll and a comparative sales analysis.

Distribution Assistance

Guy A. Martz, corporate director of distribution, looks forward to the computer providing considerable assistance in coping with distribution problems.

"Transportation and storage are major cost factors for us to cope with and any help we can get from the computer in these areas is a real plus in making our operations more efficient."

The continuous requirement for refrigeration keeps transportation costs high because of the constant need to ship in "reefer" trailers, Martz explained. Since the advent of the energy crisis, fuel costs had increased sizably, he said.

"All of this means we've got to be a lot smarter in routing our own 41 tractor-trailers and those we use from common carriers."

Refrigerated warehouse space costs about five times more than regular warehouse space and is sometimes difficult to obtain, Martz said.

"As a result, we have to do very careful planning on where to produce and store the 600 different items in our lines to give our brokers and customers the best possible service, yet at the same time keep our inventory levels down to a minimum," he said.

To solve these problems, work is already advanced on two forecasting and truck scheduling applications.

Forecasting Program

The forecasting program (now being performed manually for some products) will be a highly refined and sophisticated system to provide many of the answers in deciding where to make and store products most economically and efficiently.

A model will be developed every month to produce a sales marketing plan for all products at the broker's level.

Projected to anticipate sales three months in advance, the forecast can be obtained nationally, regionally or for a particular market area.

The second program, known as Route Organization and Optimization (Root), will schedule vehicles on a weekly basis from one depot to several receiving stations in an optimal fashion.

The order entry function is a part of the Rich order and distribution system (Roads). In the near future, the approximately 250 orders received daily at Buffalo, which are presently keypunched on cards and then entered into Roads, will enter into the system more expeditiously on a real-time basis by using visual display terminals.

Billing now being done on an average of four to five days after shipment of the order will be performed on the same or the next day.

As to the future, "We're looking at a number of plans including extensive use of data communications to link all of our production facilities," Meyers said.

"Beyond that, we're studying Univac's Unis, DMS/90 and IMS/90.

"By some combination of these packages, we plan to revolutionize our entire production, inventory control and distribution network to pull together all of these functions and to provide information of real value to management in charting our short-range and long-range goals," he concluded.

COM perspectives from Kodak:

Understanding the economic impact of a Kodak COM installation.

The most cost-effective approach to COM is a lot easier to find now because of a Kodak service called PRINTCOM. It lets Kodak actually premeasure the savings you can expect, using your own cost figures, when you put a Kodak KOM-80 microfilmer to work in your EDP environment.



The PRINTCOM terminal.

During PRINTCOM analysis, we input as many as 300 of your cost variables into a PRINTCOM terminal and get back a detailed financial analysis of your immediate savings and of your long-term savings potential.

You will find this information invaluable, particularly in light of the emphasis being placed on return on investment.

Beyond PRINTCOM, Kodak is putting a great deal of effort into COM research. Some of this effort and investment has already paid off in technological improvements and versatile software programs Kodak can provide to its users.

A case in point is our new INFO-LINK I software package. It does away with the need for new application programs each time a microfiche job goes 'live.' It's just one more way Kodak can help you maximize your savings in the EDP environment.

The closer you are to COM, the sooner you should check with us. For an informative view of microfilm and the computer, write today. Eastman Kodak Company, Business Systems Markets Division, Dept. DP5844 Rochester, N.Y. 14650.

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Kodak KOM-80 microfilmer. For top throughput speed with high reliability.

ASK CONTROL DATA for MOS Monolithic Memories for every IBM 370-135, 145, 155, 158, and 165.

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With more installation and maintenance experience than any other independent!

CDC provides complete software compatability, better maintainability, dedicated installation teams and total service support in its compact, energy-saving MOS monolithic memories.

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Graceful degradation	x	x	x		x	
Out of Bounds		x		x		x
Space Saving				x		x
Power & Cooling Savings	x	x	x	x		x
Leased memory for any purchased CPU's	x		x		x	

Control Data — the leading independent. It's been around a long time — and it'll be around for a long time to come. For further information, call your local CDC sales office, or CDC Hotline Collect (612) 853-7600, or send coupon.

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CONTROL DATA CORPORATION

COM Allows Auto Parts Dealers To Answer Queries in Minutes

PORTLAND, Ore. – The Volkswagen (VW) owner who walks into a dealership office here usually expects it will take days to locate the parts he needs to put his car back on the road.

However, within two or three minutes, the parts clerk has looked into his own inventory, the regional warehouse and Volkswagen of America's master depot in Washington, D.C., for hard-to-get items.

In two more minutes, he has made a call to regional VW distributor, Riviera Motors, Inc., here. The order will be filled and shipped that day to the driver.

The explanation for the faster-than-expected service lies with the use of comuter output microfilm (COM).

In this case, Riviera sends its inventory-data on computer tapes to U.S. Datacorp, which outputs the data onto 7 in. by 9-1/2 in. microfiche cards. These cards are updated every Saturday and sent out to the dealers.

By each Monday morning, 100 VW, Porsche and Audi dealers in Oregon, Washington, Idaho, Montana and Alaska know as much about the total inventory picture on VW, Porsche and Audi parts as Rivera's top warehouse people.

Each microfiche card contains all the information normally found in about 500 pages of ordinary computer printout, according to Dieter Zunk, Riviera's field operations manager.

"Before we put this system into operation, all our dealers had were parts catalogues from Volkswagen of America and nothing about our inventory here at the distributorship," he said.

"Everything is easier and faster to locate," Russ Taylor, parts manager for Gilbert & Seibel Volkswagen in Vancouver, Washington, said. "Once you get used to looking at a microfiche reader's screen, rather than thumbing through manuals, it's a breeze."

"I can look items up nearly three times faster and know for sure if the part is at Riviera. It helps when you have an anxious customer standing at the counter," Midway Volkswagen Parts and Service Manager Don Reader said.



One of these six-inch-long, gold-finished plaster paper weights is yours for $5.95 from Brian Productions, Mid City P.O. Box 101, Dayton, Ohio 45402.

Three Phoenix Has Floppy Disk Tester

PHOENIX – The Testette Model 33 FD floppy disk tester checks for modulation, missing pulse and extra pulse with a throughput of 1-, 1.6- or 3.2 minutes, depending on the degree of surface testing desired and whether track overlap testing is required or not, according to its maker, Three Phoenix Co.

Analog Clipping Levels

Tests are made at singular, adjustable analog clipping levels and performed over 234 tracks. In the production test mode, when an error is encountered, the certifier will abort the test automatically, return the carriage to home and indicate on the front panel the type of error detected.

The device can also be used for diagnostic testing under manual control.

The unit sells for $18,500 from the firm at 10632 N. 21st Ave., 85029.

Ansi Standardizes Microfilm Cartridge

WASHINGTON, D.C. – The American National Standard Institute (Ansi) has approved American National Standard "Dimensions and Operational Constraints for Single Core Cartridge for 16mm Processed Microfilm," according to the National Micrographics Association (NMA).

The standard cartridge is expected to be used universally in all newly manufactured microfilm readers and reader/printers, regardless of the manufacturer, NMA said.

The standard was described as a major breakthrough for cartridge users who presently must carefully choose the proper cartridge so it fits into the corresponding machine.

The standard also established a uniform design for the winding of processed microfilm on the reel and for the physical properties of the lead end of the film.

Requirements for the reel are also specified: they include configuration, trailing end of film, leading end of film, separate leaders, optical compatibility, materials, reel capacity and permanent markings.

This standard is available from the NMA (NMA MS15-1975). Members should send $3.00, nonmembers $4.00 to the NMA, Publication Sales, 8728 Colesville Road, Silver Spring, Md 20910.

Magnetic Tape Added To Model in GSP Line

MIAMI – Datatype Corp. has added a system with a magnetic tape capability to its GSP line of optical character recognition (OCR) systems.

Called the GSM-40, the system consists of the scanner, a full-screen editing terminal and a magnetic tape recorder.

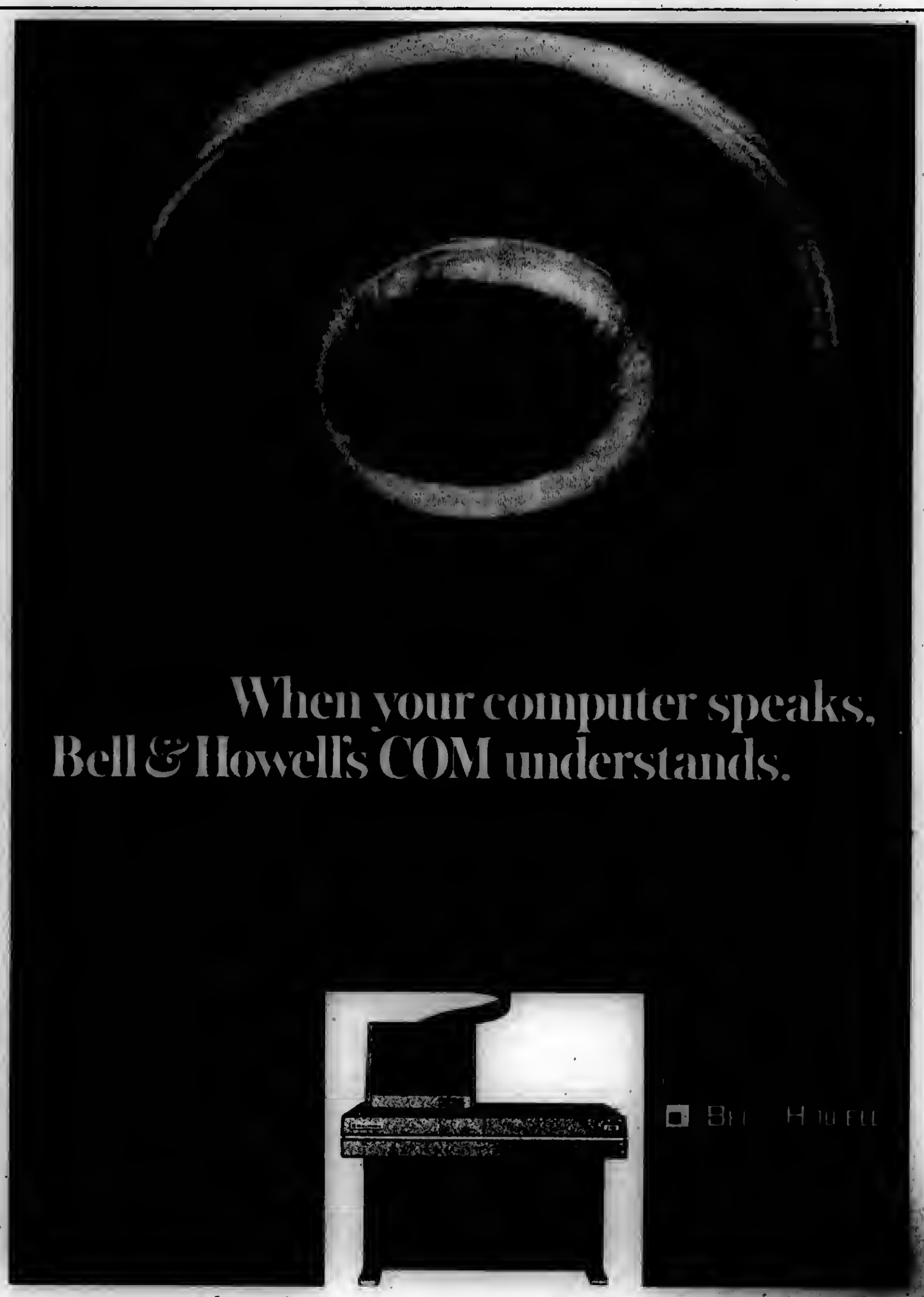
The input copy for the GSM-40 is prepared on standard IBM Selectric typewriters using any of the several typing elements available from IBM and Datatype. The output can be 7- or 9-track, 556- or 800 bit/in. magnetic tape.

The system's normal throughput speed will process the production of up to 20 typists without creating a bottleneck, Datatype said.

The GSM-40 costs $22,400 from the firm at 1050 N.W. 163rd Drive, 33169.

Correction

Southern Systems, Inc. is located at 1011 S.E. 7th Ave., Pompano Beach, Fla. 33060.



Invest in yourself this fall.

Announcing the EDP Seminar Series Fall Schedule

The world of EDP is caught up in a continuous revolution. It's only 24 years since the first business computer made its appearance, and we've gone from tubes, batch processing and single-site giants to multiprogramming, time sharing, data communications, giant minicomputers and hundreds of other technological innovations that were unheard of only recently. Keeping up with this revolution is difficult, to say the least. And that's why we've created the EDP Seminar Series.

The EDP Seminar Series gives you practical applications of the newest advances in computer management. What you learn will save you time and money, because each course is geared to practical dollars and sense application.

Remember, these are seminars, not lectures, and you'll be learning by doing in a shirtsleeve atmosphere. Workshops are an important feature of the Seminars, and round table discussions and shop talk luncheons complement the seminar presentations. The workbooks and course materials are yours to keep, so you'll always have a handy reference to all you've learned.

We've selected leading experts from around the country to guide each of our Seminars. They are highly accomplished specialists in their fields, experienced in presenting their techniques to industry and management. If you're involved in one of the areas shown, you should attend the EDP Seminar Series this fall. What you learn will benefit your company, your installation, and you.

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

Wash., D.C.	**Marriott at Wash. Int'l. Airport**	**Oct. 20-21**
Chicago	**Hyatt Regency O'Hare**	**Oct. 27-28**
San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams.

Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

New York	**St. Moritz**	**Oct. 6-7**
San Francisco	**Berkeley Marriott**	**Nov. 10-11**

Data Base Design

Given in association with Leo J. Cohen and Performance Development Corporation, this three-day seminar is a package-independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimum File Organization/Indexing Techniques, File Integration, and much more.

Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300.

Denver	**Denver Hilton**	**Dec. 1-3**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

New York	**Summit Hotel**	**Oct. 22-24**
San Francisco	**Hyatt Regency San Francisco**	**Nov. 12-14**
Chicago	**Hyatt Regency O'Hare**	**Nov. 19-21**

Data Communications Course #1010 – Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

New York	**St. Moritz**	**Oct. 13-14**
San Francisco	**Dunfey's Royal Coach**	**Oct. 20-21**
Dallas	**Hilton Inn**	**Nov. 10-11**
Miami	**Marriott Miami Beach**	**Nov. 17-18**

Data Communications Course #1020 – Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Miami	**Holiday Inn Airport Lakes**	**Dec. 1-3**

How to Draft Effective Legal Agreements

This one-day seminar is a complete workshop for non-legal, technical people who may be called upon to draft legal agreements for their company. Also led by Roy Freed, this seminar covers a variety of formal agreements, their structure and the legal factors involved. You'll have all the basic skills necessary to write legal agreements, and you'll be able to spot items that really require the attention of lawyers.

Cost for the seminar, including luncheon and a complete workbook on the subject, is $135.

New York	**St. Moritz**	**Oct. 8**
Boston	**Sheraton**	**Oct. 15**

THE EDP SEMINAR SERIES

Sponsored by **COMPUTERWORLD.**
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NOTE: If time is short, you may reserve space at any seminar by calling collect. Call Miriam Ober at (617) 965-5800.

MINIWORLD

Mini Bits

CFI Gets IBM Nod to Sell Memory for S/3 Model 15

ANAHEIM, Calif. – CFI Memories, Inc. has received IBM approval for the sale of its add-on semiconductor memory for the System/3 Model 15.

The CFI memory is available for delivery within 30 days from receipt of order and is priced at levels 20% to 30% lower than standard IBM pricing, the firm claimed.

The memory consista of a primary circult board measuring 12-3/8 in. by 9-1/4 in., which contains control circuitry and sockets into which memory modules are plugged for expansion. The main board plugs directly into the IBM central processor.

"Our add-on memory permits Model 15 users to expand their systems in normal IBM increments, from 48K to 128K on Models A and B and from 160K to 256K on Model C," according to Robert M. Miller, CFI vice-president.

The firm is at 305 Crescent Way, 92801.

3M Drives Offered for OEMs

WALLINGFORD, Conn. – Northeast Services, Inc. has announced a full line of 3M cartridge drives for OEM applications.

The TCD300 cartridge drive is offered in small quantities for $255.00. Tape speed is controlled by a "synthesized tachometer" system not only during read/write operations, but during start/stop as well.

This assures accurate interblock gap lengths and tape positioning required for search or edit operations, according to the firm.

Data may be written at 1,600 bit/in phase-encoded at 30 in./sec. The TCD300 uses a 1-, 2- or 4-track dual gap read-after-write head.

Further expanding the TCD300 tape cartridge drive is an RS-232 tape cartridge transceiver. Used as a magnetic tape peripheral, it has the ability to capture, edit, search, receive and transmit data with full error-checking features.

With a single quantity price of $1,980, this unit can be used as a paper tape replacement or a high-speed, 960 char./sec program loader.

The firm also announced a minicomputer cartridge unit. Features include up to 20.5M bytes of on-line storage, one to eight drives per controller, 6K byte/sec transfer rate; and 120 in./sec independent rewind.

Interfaced to the Digital Equipment Corp. PDP-11 Unibus and software-compatible with the TA-11, the basic unit in OEM quantities sells for approximately $2,100, the firm said from 36 Highland Ave., 06492.

Maxi, Mini, Micros in Series

GA 'Solution' Compatible With SPC-16

By Patrick Ward
Of the CW Staff

NEW YORK – A 16-bit "maxi-computer" that can address 1M words of memory, a large-scale integration (LSI) mini and two microcomputers have been announced by General Automation (GA).

Called the "Solution Series," the four machines are software- and I/O-compatible with GA's SPC-16 minicomputer line, a spokesman said.

The GA-16/440 maxicomputer, GA's first machine of this size, is primarily aimed at the large user who can do its own systems work and at OEMs, a GA spokesman said.

Described as "a systems programmers' machine," the microprogrammable GA-16/440 includes an enhanced version of the SPC-16 instruction set with standard extensions to accommodate hardware stack operations, argument transfer capabilitiea and full left shift, GA said.

The GA-16/440 can address 1M words of memory with all 11 of its functional addressing modes. It also has 16 hardware general-purpose registers and three levels of priority interrupts, GA said.

Complete parity, write and execute protect capabilities and 512 64-bit words of control store expansion are available.

The GA-16/440 offers 720 nsec basic instruction execution time through its use of MSI Schottky logic and high-speed core, GA said.

Programming languages include Extended Fortran, Cobol, Basic and Macro Assembler. Several operating systems are available for data processing and control applications.

LSI and Core

The GA-16/330 is an industrial/OEM minicomputer designed for dedicated real-time applications. The unit combines the high performance and the low price and power consumption of LSI with the reliability of core memory, GA said.

A one-board minlcomputer, it is centered around a 16-bit n-channel MOS processor with optional control store expansion. The unit features a 720 nsec memory cycle time; extended instruction set; full word, byte and bit manipulation in memory and registers; complete interrupt structure; and a range of higher level language compilers, assemblers and interpreters, GA said.

The GA-16/110 microcomputer includes an n-channel silicon gate MOS LSI processor, 4K of random-access memory (RAM) and I/O capabilities on one 7-3/4-in. by 11-in. board.

It offers 91 basic microprogrammed instructions, 16 general-purpose hardware registers, vectored priority interrupts, hardware multiply/divide, fully parallel I/O bus, memory expansion to 64K directly addressble words and a real-time fail-safe group including power fail/auto restart, operations monitor alarm, system fail restart and real-time clock interrupt.

The GA-16/110 also offers optional memory parity error detection and recovery interrupt, memory write protection and a control store expansion module.

A real-time executive Control II, provides the operating environment.

The GA-16/220 microcomputer system consists of two 7-3/4-in. by 11-in. boards, In addition to all the features provided by the GA-16/110, it also offers multichannel cycle stealing DMA, integral serial I/O controller, microconsole read-only memory (ROM), real-time clock and full operator controls.

The GA-16/220 is supported by three operating systems that provide disk-based Control I, real-time scheduling Control II and real-time foreground/background multiprogramming operating environments Control III.

It can be programmed in Basic, Fortran, Assembly or Cobol.

Prices for the GA-16/440 and GA-/16/330 start at $8,950 and $3,250 respectively. The GA-16/110 and GA-16/220 microcomputer systems cost from $531 and $765 respectively in OEM quantities.

General Automation is at 1055 South East St., Anaheim, Calif. 92805.

Harris 24-Bit Mini Set to Vie In Upper End of 'Midi' Market

FORT LAUDERDALE, Fla. – Harris Computer Systems here is expandlng its Slash line of minicomputers with a 24-bit machine which, it said, will compete in the upper end of the midi market against such systems as the Interdata 8/32, Modular Computer Systems' Modcomp IV, Systems Engineering Laboratories' SEL 55, the Data General Eclipse S-300 and Digital Equipment Corp.'s PDP-11/70.

The Slash 7 features an asynchronous CPU with instruction prefetch and interleaved core memory for a cycle time of 425 nsec, according to the firm.

The system uses software that has been in the field with the rest of the Slash line, including four operating systems: resident (ROS); tape (TOS); disk (DOS), and disk monitor (DMS).

In addition, a total of six language processors round out the software package. They are Fortran IV, Cobol, Interactive Basic Compiler, Snobol 4, RPG-II and a Macro Assembler.

The Slash 7 CPU offers multiported memory in both core and semiconductor. With I/O processor channels on the multiported memories, high transfer rates can be achieved, the company said; semiconductor memory can transfer at 4.8M byte/sec on one port or interleaved multiple channels at 15M byte/sec.

The Slash 7 interfaces with peripherals currently used with the Slash 5 and Slash 4 and S100 and S200 systems.

The basic Slash 7 CPU with 32K core memory is priced at approximately $45,000, Harris said from 1200 Gateway Drive, 33309.

Has Anyone Seen This Mini?

NEW STANTON, Pa. – The lure of a $7,500 reward and state and federal help have not turned over any substantial clues in the theft here of a minicomputer system.

The experimental teaching device, named Leahcim, was stolen June 12 from a hotel parking lot on the Pennsylvania Turnpike, according to Harold Smith.

Smith is president of Harold Smith Adjustors, the Manhattan insurance adjusting firm which is offering the reward.

"It's still missing," he said. "We have the FBI and the Pennsylvania State Police in on the case and leads all over the place," but none have been successful.

Leahcim's conversational capabilities, which include prolonged dialogue if an incorrect answer is made by pupils, won its developer, Prof. Michael Freeman, and his invention a televised guest appearance on the Phil Donohue show, aired in Chicago.

En route back to New York, Freeman decided to make a stopover here, leaving the system overnight in a van in the hotel parking lot, Smith said.

The next morning he discovered the device had been stolen.

The minicomputer was insured with Lloyds of London for $75,000, Smith said, adding his firm is the New York representative of Lloyds.



Half-Card Naked Milli Systems Released as Packaged Versions

IRVINE, Calif. – Computer Automation (CA) has introduced the Alpha LSI-3/05 series of computers.

Packaged versions of the half-card Naked Milli computers announced last January, the Alpha LSI-3/05 series is designed with standard, off-the-shelf TTL components for low-end applications.

The Alpha LSI-3/05 computers come in three different series, each mounted in a chassis and featuring a variety of models.

- All the models of the A series include a Naked Milli half-card CPU, a 10-A power supply, a three-slot motherboard and an operator's console. The lowest priced model has 256 16-bit words of semiconductor (MOS) random-access memory (RAM) on a half card with sockets for up to 8K of read-only memory (ROM) chips and a price of $701 in lots of 100.
- The B series begins with the same configuration as the smallest A series model but includes a 15-A power supply and a five-slot chassis. The smallest model is priced at $829 in the same lot size.
- The C series computers use the five-slot chassis and 15 A power supply and come with a programmer's console, instead of an operator's console. The price for the smallest configuration (including the same CPU and memory as the A and B series) is $1,012 in lots of 100.

A variety of other configurations, including some with standard full-size chassis, accommodate up to 32K 16-bit words of directly addressable memory.

Miniworld Products

Floppy Disk Drive Added to CDC Line

LOS ANGELES – Control Data Corp. has announced an addition to its 9400 flexible disk drive line for the OEM market, the 6.4M-bit-capacity CDC 9404.

Up to four Model 9404 drives can be interfaced in a daisy-chain configuration via multiple connectors using a single flat-ribbon cable to further reduce system cost, the firm said.

Average power consumption and heat dissipation have been reduced in the 9404 since power to the stepper motor drops from a nominal 29 watts to less than 2 watts when the unit actuator has reached the final track location, CDC said.

According to company tests, power supply and cooling requirements can be reduced by more than 50% in a system using four drives.

Rotates at 360 Rev/Min

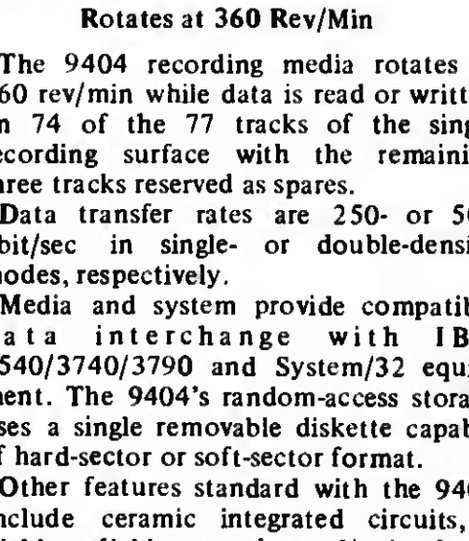
The 9404 recording media rotates at 360 rev/min while data is read or written on 74 of the 77 tracks of the single recording surface with the remaining three tracks reserved as spares.

Data transfer rates are 250- or 500 kbit/sec in single- or double-density modes, respectively.

Media and system provide compatible data interchange with IBM 3540/3740/3790 and System/32 equipment. The 9404's random-access storage uses a single removable diskette capable of hard-sector or soft-sector format.

Other features standard with the 9404 include ceramic integrated circuits, a highly reliable ceramic read/write head, continuously monitored unit-read interrupts, write-fault circuitry and write-current selection.

The 9404 will be available this month, and deliveries are scheduled 45 days after receipt of order. The unit is priced at $450 to $500 in OEM quantities, the firm said.



CDC 9404

DEC Users Get Floppy Unit

BERKELEY, Calif. – A floppy disk system is said to offer Digital Equipment Corp. users twice the capacity of the comparable DEC unit at the same cost.

A microprocessor controller is used to interface the DSD 210 floppy system from Data Systems Design (DSD) to DEC PDP-11, LSI-11 and PDP-8 CPUs with complete instruction sets and media compatibility, DSD said.

The system, interchangeable with the DEC RX8/RX11 floppy disk system, is a complete package, including two or four diskette drives, a microprocessor controller, an interface to the minicomputer, a control panel with individual write protect switches, power supplies and all cables.

Diskettes for the 210 are written in IBM format, which includes flexible soft sectoring and reliable cyclic redundancy-check error detection. Microprocessor architecture results in high-reliability through a self-test microprogram and a small component count, the firm said.

Diskette capacity per drive is 256K bytes with a data transfer rate of 10 kbyte/sec. The 210-8 system permits PDP-8 users to store data in the normal 8-bit byte mode or in a special 12-bit word mode.

The 210 is available in tabletop or rack-mounted versions. The minicomputer interface occupies one small peripheral slot on the PDP-11, a single LSI-11 backplane module location or one Omnibus slot on the PDP-8. DSD makes the controller available to OEMs. Quantity discounts are offered to both end users and OEMs.

The 210 costs $2,995 for a unit with two diskette drives.

Deliveries are 30 days from the firm at 1122 University Ave., 94702.

SILENT 700
electronic data terminals

Texas Instruments "Silent 700" programmable data terminals:

A price you can afford. Performance you can count on. And copy you can keep.

"Silent 700*" Model 742 programmable data terminals offer a lot more than mere intelligence for business management systems.

They give you a complete terminal package in locations where most business information is generated and used . . . such as remote offices, warehouses, stores or hospitals.

A quiet, self-contained thermal printer gives you a retainable audit trail of transactions for easy reference, routing and filing.

The simple TICOL language lets you generate your own user programs on the terminal itself, with no separate equipment or central computer support required.

And the same terminal package holds all the communications features and options you need to move data to and from your computer or other terminals.



Versatile "Silent 700" programmable data terminal offers easy operation and powerful options for many business management systems.

Cost-effective performance

Standard in each "Silent 700" programmable data terminal is the microprocessor and memory capacity to handle most user applications.

For applications requiring increased capacity, additional memory with a more powerful TICOL language can be added as an option in the same terminal package.

Dual magnetic tape cassettes let you store your programs and data conveniently, for later transmission to your computer.

And combined with these powerful performance features are quiet 30-characters-per-second printing speeds and communications features that help reduce over-all system costs.

Improving man's effectiveness through electronics

Proves Productivity Booster

Mini Shepherds Sludge at Pollution Control Plant

SAN JOSE, Calif. – A minicomputer-based control system is boosting productivity and lowering energy consumption at the San Jose/Santa Clara Water Pollution Control Plant here.

The Varian 620L minicomputer is at the heart of the automated system, which has virtually taken charge of a large portion of the routine management of the plant.

The mini receives all operating information such as flow rates, tank levels, air pressure and valve positions. It displays and records the information and coordinates the flows into and out of the various processes based on preset tolerance levels.

The control system automatically distributes incoming raw sewage to the plant's 24 primary tanks. The mini then directs the flow of settled sewage and biological solids to the aeration tanks and controls the 2,400-horsepower engines which drive centrifugal air blowers to introduce the correct amount of dissolved oxygen.

This oxygen permits activated sludge containing millions of microorganisms to feed on the organic matter in the sewage.

The mini assigns the aeration tank effluent to the plant's 22 final tanks, where the biological solids and the clear, treated effluent are separated. The effluent is discharged to the chlorination facility and then to San Francisco Bay.

Besides improving system balancing and effluent control, the computerized system has improved plant productivity, since few new personnel were required when the plant expanded in capacity recently.

Also, the automated control of the aeration and nitrification processes is expected to reduce blower use and lead to energy and engine-wear savings. Furthermore, by more efficient dispensing of chemicals in the sludge-thickening process, an additional savings is anticipated.

Administration Better

The availability of timely management information has also improved plant administration. CRT display units provide "live" process readings as well as hourly, daily and monthly averages of any plant process measurements on demand.

The computer memory stores flow diagrams which can be displayed on a video display showing graphically each of the plant's operating areas and current measurements there.

The computerized control system was designed and programmed by Fischer and Porter, a company headquartered in Warminister, Pa. The company supplies instrumentation, computer systems and chlorinating equipment in the environmental field, as well as other areas.

The Varian mini has a 24K core memory. Other equipment includes a multiplexing unit to receive the analog field input signals and two analog-to-digital converters.

The system is designed for 400 analog inputs and 160 on/off-type inputs. Two printers are used – one to signal and document alarm conditions and one to periodically summarize plant conditions.

There are 20 pen-operated trend recorders and a keyboard console with video display which is the main controlling unit. Flow schematics and data tabulations are presented on a second video display.

A backup computer performs off-line data processing and program development functions. A magnetic tape unit is used for storing process information and loading software.

Three teletypewriters, including one in the laboratory where sewage samples are analyzed for toxic substances and process efficiency, are also used as input/output devices.

Fischer and Porter chose the Varian machine for "flexibility, cost and speed," according to project engineer Val Rutups.

"The system is expandable to monitor 2,000 points and the computer is compatible with a variety of other hardware," he said.

Data Reduction Unit Reduces Time Needed To Test New Planes

WICHITA, Kan. – By using a recently acquired automated data reduction system containing a minicomputer, Beech Aircraft here has been able to reduce the flight time necessary to test models of its new planes.

It can do this because the system can record more data in fewer flights than its manual predecessor system could.

The system, whose hardware and software were supplied on a turnkey basis by Aydin Monitor Systems of Fort Washington, Pa., includes a 12K Varian 620L 16-bit minicomputer, a card reader, teletypewriter, digital tape recorder and line printer.

The system works this way: The aircraft carries a small portable pulse-coded modulation (PCM) system which is essentially a multiplexer and encoder. Readings of various physical parameters, such as temperatures and pressures, are taken at intervals as small as six msec through sensors.

The serial digital PCM data is recorded on magnetic tape in the aircraft. The data collected includes, for example, engine temperature, air conditioning temperature, pressures of cooling flows, generator temperatures, electrical currents within the electrical system aboard, air speed, altitude, acceleration and pitch and roll rates.

Time code from a time-code generator is recorded simultaneously on a separate tape track.

When the airplane has returned, the tape containing the collected data is delivered to the system. The system then reads the taped data, printing out tabulations of parameters under study vs. time.

If there is a particular period during the test flight which is of special interest, the mini or a larger computer may be used by Beech to do further "number crunching" and generate more detailed plots.

Systems network adaptability

If your business system involves tying your Model 742 terminals together in a complete communications network, TI offers the Model 700 TPS* Terminal Polling System.

Designed around the TI Model 960 Series minicomputer, the TPS automatically calls remote "Silent 700" data terminals, collects data stored on the magnetic tape cassettes, and logs the data on magnetic tape in a format readable by a host computer.

This scheme gives users a complete, cost-effective data capture network for distributive data processing and communications.



International Harvester dealers throughout the country use "Silent 700" programmable data terminals for quick, economical management of inventory and accounting data.

International Harvester found more . . .

International Harvester, which recently selected a large quantity of these models for use by its dealers for remote data entry and local processing in Service Parts Inventory Management and Dealer Accounting Data Services, has this to say:

"The TI terminal answers International Harvester's needs — simplicity of operation; nationwide service and the capacity to fill our dealers' requirements at a moderate price."

International Harvester dealers throughout the country will benefit from reduced information transmission time, better control of warehouse parts inventory and smoother daily operation with continually up-to-date information.



Model 700 TPS Terminal Polling System links the TI 960 Series minicomputer with "Silent 700" terminals for a complete data network.

What's your application?

If you're interested in an affordable solution for your distributive data processing and business management systems needs, contact the TI problem-solvers at the nearest office listed below. Or, write Texas Instruments Incorporated, P.O. Box 1444, M/S 784, Houston, Texas 77001. Or, call Terminal Marketing at (713) 494-5115, ext. 2126.

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TEXAS INSTRUMENTS
INCORPORATED

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System/3 computer users have been liberated! (Spread the word.)



When we announced the Honeywell Liberator/3 to replace System/3 computers, we knew our cause was just.

And already our cause has been joined by companies like Certified Oil of Columbus, Ohio; Shurfine-Central of Northlake, Illinois; Echo Communications of Cedarburg, Wisconsin; Veriflo of Richmond, California, and many others.

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COMPUTER INDUSTRY

CI Notes

Micro Firms Sign Agreement

NEW YORK – National Semiconductor Corp. and Rockwell International's Microelectronic Device Division have signed a comprehensive agreement making each a second source for the other's microprocessors.

The move plugs holes in the product lines of each company while enlarging the total sales potential of their combined products in the microprocessor marketplace.

The agreement covers both firm's complete line of microprocessor products, provides options on second sourcing modifications and establishes policy for periodic review of new processor developments.

In addition to establishing competitive second sources for their microprocessors, the agreement provides each company with a microprocessor line ranging from 4-bit low-cost systems to high-performance 16-bit systems.

Itel, Central Data Make It Legal

SAN FRANCISCO – Itel Corp. has annouced papers have been signed making its acquisition of Cleveland-based Central Data Systems, Inc. legal and final.

The price was $3.5 million.

Calcomp Picks Agfa-Gevaert

ANAHEIM, Calif. – California Computer Products, Inc. (Calcomp) and Agfa-Gevaert of Antwerp, Belgium, have signed an agreement making Agfa-Gevaert the distributor for the Calcomp 2100 line of alphanumeric computer output microfilm (COM) printers in Western Europe, except for Italy.

Calcomp will continue to handle COM sales in Italy and in Eastern Europe as well as in the U.S., Canada, Latin America and Asia, according to the agreement.

Supershorts

Tektronix, Inc. has been awarded $7.4 million in the patent infringement suit filed against the U.S. in 1961. U.S. Court of Claims Judge H. Cooper awarded $4.8 million in royalties for patent infringement and $2.5 million for delayed damages.

The award is subject to possible appeal and congressional appropriation.

– – –

Cognitronics will market and manufacture Optical Recognition System, Inc.'s optical character recognition (OCR) equipment exclusively worldwide, according to a recent agreement signed by the firms.

With this agreement, Cognitronics expands its line of equipment to cover virtually all types of OCR applications.

Service will be provided through existing facilities of both companies.

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Computer Interface Systems, Inc. has formed a Control Products Division to manufacture and market minicomputer-based process control systems for the chemical batch-processing industry.

Auto-Con, the division's first product, is a turnkey system in the $100,000 range to handle three to 15 vessels.

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Memorex Corp. will display its 1600 series on-line computer output microfilm system for the first time at the International Micrographics Conference in Sydney, Australia, next month.

The demonstration will be presented by the company's Australian marketing subsidiary's sales engineers.

Undaunted by Telex Settlement

IBM Rivals to Pursue Antitrust Cases

By Nancy Freneh
Of the CW Staff

The Telex decision to settle its claim against IBM and withdraw its Supreme Court appeal will not affect other competitors' intentions to pursue their various antitrust suits against the giant mainframe manufacturer "diligently."

This was the consensus expressed by spokesmen from at least four such firms with trials scheduled one after another throughout 1976 and early 1977.

"You have to look at why Telex settled," Sanders Corp. Counsel John Keefe said in Nashua, N.H.

"If the Supreme Court refused to take its appeal, the $18.5 million judgment would have become final," he said.

"There was no reason for the Supreme Court to take this case, despite the fact large amounts of money and important legal principles were involved, particularly since a lot of the same issues are pending in the federal action in New York," he said.

"IBM, on the other hand, has relieved itself of a problem in settling," he said. If the Supreme Court had refused to take the appeal, IBM would have been faced with enforcing the $18.5 million judgment against Telex, which would have "put Telex out of business."

For IBM, $18.5 million is "chicken feed," and trying to collect it would have been "very bad public relations for them," he said.

Aside from restating its resolve to continue to pursue its suit against IBM, Memorex Corp., in Santa Clara had "no comment" on the settlement, but California Computer Products, Inc. (Calcomp) in Anaheim did.

Why Settle Now?

"Obviously, we don't know what transpired between Telex and IBM, but we understand there have been extensive negotiations between them for the past three days," the Calcomp spokesman said.

"The curious thing about it is why Telex settled now, rather than waiting to hear if the Supreme Court was going to hear its appeal.

"Telex said it couldn't afford to pay the judgment, and if it couldn't afford to pay it on Friday, it still couldn't afford to pay it on Monday, so why not wait until Monday and see what happened at the Supreme Court?" the Calcomp spokesman asked.

"If the Supreme Court won't hear the case, IBM's won. If the Supreme Court is going to hear the case, and you're concerned about losing, then you ought to settle, if you're IBM. If you're not concerned about losing, why bother to settle?" he said.

"As for our case against IBM, we believe, with the information now available, particularly the documents that turned up recently concerning IBM's reasons for not entering the plug-compatible peripherals business, we have an excellent chance of winning our lawsuit.

"We're diligently preparing for that suit and, to my knowledge, IBM has not approached us for a settlement," he said.

"We're suing for $150 million and, if we win, we'll get treble that amount – $450 million. That's a lot of money," he said.

Jay B. Langner, president of Hudson General Corp. in Great Neck, N.Y., also refused to speculate on the Telex or Marshall settlements. "I'm sure each had its own reasons for wanting to settle," Langner said.

Hudson, a third-party lessor and owner of Telex peripherals, has a $28 million antitrust suit pending against IBM.

Hudson was scheduled to go to joint trial with Transamerica Corp. and Marshall in Los Angeles next August. However, now that Marshall has dropped its suit and settled out of court, only Hudson and Transamerica remain.

Commenting on Marshall's decision to settle, Transamerica Counsel Walter Lewis said, "we were disappointed, but we recognized that Marshall's financial position was such that it had to view with great concern its capabilities of incurring the cost of prosecuting a case of this type."

A Marshall spokesman in El Monte, Calif., is reported to have pointed out that, since Marshall isn't in the computer peripherals business any longer, the firm doesn't have to fight to maintain a place in the industry.

Honeywell Announces Interest In Acquiring Xerox User Base

By a CW Staff Writer

MINNEAPOLIS – Honeywell Information Systems (HIS) President Clarence W. Spangle has made public the firm's interest in "the disposition of the Xerox Corp. Data Systems Division" in a formal announcement here.

"Honeywell has been studying the situation since Xerox announced its withdrawal from the computer mainframe business, and initial meetings have been held in El Segundo, Calif., and Stamford, Conn.," Spangle said.

Questioned about the firm's ability to raise the funds needed to acquire the entire Xerox computer mainframe operation, a spokesman who noted "disposition" covers a lot of things, confirmed that Honeywell was primarily interested in the Xerox customer base, rather than in its facilities or sales operation.

Talks were "very preliminary," he said.

"There's a lot of horse trading yet to be done," he said. "We're interested in those aspects of the company that would best fit in with the rest of our operation and, as to what aspects are negotiable, I don't know."

A Xerox spokesman contacted about the announcement would say only that Xerox is "negotiating" with Honeywell as well as Univac.

He said that, as far as he knows, Honeywell and Univac are the only two real contenders in present negotiations and that, despite its enthusiasm, "Telefile is not a realistic contender at the moment."

Noting that Xerox systems on rent worldwide are worth about $105 million at original purchase price, "Honeywell could probably negotiate a figure it could handle," an industry souce said.

"Honeywell has experience acquiring other company's users," he said, pointing out that the firm is still serving former General Electric customers today.

Univac declined to comment on the announcement.

Why Buy Another Company's Customers?

By Edith Holmes
Of the CW Staff

NEW YORK – The motivation behind acquiring another computer company's customer base is increasing a company's market share, Clarence W. Spangle, president of Honeywell Information Systems (HIS) and executive vice-president of Honeywell, Inc., said here last week.

This was the primary motive behind Honeywell's acquisition of General Electric's (GE) computer assets, Spangle said in testimony presented in the government's antitrust suit against IBM in the U.S. District Court for the Southern District of New York.

By continuing to increase its market share, Honeywell hoped to achieve a relatively stable position in the marketplace.

There were other reasons behind the acquisition as well, he added. Among them were: recognition of the increasing difficulty Honeywell faced in replacing the installed systems of competitors, realization that the chief possibilities for growth rested with its present customer base, awareness that the European market was growing faster than the U.S. market and the belief that there was a need for Honeywell to make a strong entry into the large systems class.

The GE base was attractive to Honeywell because its acquisition would provide some room for expansion in the U.S., Spangle said.

GE also had greater holdings in the European market and was believed to have advanced further than Honeywell in large systems development.

At that point, Honeywell was wrestling to develop its 8200 system and recognized the coming need for substantially greater investment capital.

Honeywell wanted capital to expand its offerings in the small-systems end of the mainframe market as well, he said.

By acquiring GE's manufacturing facilities, the equipment it had installed in the field and much of its stock patents and other intangibles, Spangle said Honeywell did acquire a much larger customer base which it has been able to hang onto.

Similarly, HIS expanded its European holdings, gained management and technical talent and capitalized on GE's large-systems development.

Disadvantages, Too

But there were disadvantages as well: It took longer for HIS to develop a common product line that could be the logical successor to the machines then used by Honeywell and GE customers.

In addition, Honeywell acquired more facilities than it needed for the combined enterprise. Poor economic times, notably 1970-71 and 1974-75, increased this sense of overcapacity.

Finally, sales and service people had to be trained to market and support a much wider range of products, and Honeywell did not experience the "synergy" among its customers that would have occurred had it had one product line, Spangle said.

1100 Captures 50% of Datapoint's Disk System Sales

By Molly Upton
Of the CW Staff

NEW YORK – Sales of Datapoint Corp.'s diskette-based 1100 system account for over half of the firm's current orders for disk-based systems, Larry Harrington, product marketing manager, said in an interview here recently.

Datapoint has been shipping the 1100 since the beginning of the year.

Part of the system's popularity is due to the fact users are becoming more cost-conscious, he said.

In addition, the upward compatibility within the product line on the object-code level enables users to have increased flexibility, he said. Datapoint brought out the same compiler for different models last March.

For 1975, Harrington expects "another good year." Sales should grow a minimum of 30% to 40%, he said. This compares with 100% for each of the past three years.

Sales of the diskette unit are starting to impact the cassette 1100, he said, adding he sees the trend toward disk continuing. The diskette 1100 is even slightly impacting cartridge disk sales as well, he said.

The 1100 can run 360/20 Hasp as well as emulate an IBM 3780, he said.

Other disk-based systems use Diablo 10M-byte cartridge disks and Memorex 25M-byte units, he said.

The Datapoint 5500 can handle up to eight Memorex units, and the 2200 can handle up to four Diablo drives, he said.

With communications capability on the diskette 1100, the firm is starting to see an increasing number of networks using Datapoint equipment exclusively, he said.

For instance, a number of 1100s are being linked with a 5500 as the principal CPU. In other instances, the 5500 may link with a larger mainframe or the terminals may link with a CPU directly, he added.

The Datashare model, based on the 5500, now offers concurrent processing capability while handling communications, he said.

5500 Cuts Processing Time

The 5500, which was introduced last December, was a year late in appearing, he said. But it uses 4K chips with more instructions than the 2200, which cuts processing time by more than half, Harrington said.

The market for big systems – with up to 16 stations – is just opening up, he said. "The big job is convincing people they can have real power out there."

In line with its emphasis on distributed processing, Datapoint's target market is large corporations, he said.

With its range of offerings, Harrington said he feels only IBM also spans the range of product offerings.

And Datapoint intends to continue to offer products throughout the spectrum, he said. "You have to watch both the low and high end," he said. "You have to stay ahead or drop out," he added.

Although many firms are entering the area of distributed processing, he said Datapoint has the edge that stems from prior experience.

"We have proven software," Harrington said. "All the others are one to two years behind," he added.

Harrington said he sees Datapoint sticking to its area of expertise rather than expanding into making peripherals. The firm makes the CPUs and CRTs, most interfaces and controllers, he said.

For maintenance, Datapoint uses a Datashare system to track calls and disposition of its service engineers. It promises a call from a local service engineer within an hour.

The firm has had its own maintenance force for about 2-1/2 years, Harrington said, and charges extra for service in remote areas. There are Datapoint systems being used in conjunction with the construction of the Alaska pipeline.



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UCC TEN (Data Dictionary/Manager). For IMS users, this system centralizes, controls data definitions, provides powerful cross reference features, automatically generates data base control statements, facilitates new systems design.
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Executive Corner

Davidson Quits Honeywell

Douglas A. Davidson, the third Honeywell Information Systems vice-president to leave in two months, has resigned to join Mohawk Data Sciences (MDS) as senior vice-president for sales.

Only last month Honeywell promoted Davidson to vice-president for sales.

Other Moves

- William W. Eggleston has been elected president and a member of the board of directors of IBM World Trade Americas/Far East Corp.
- J. David Kelley has been appointed president of National Communications Data Ltd.
- Bob Robbins has been appointed vice-president and controller of the Data Processing Division of Itel Corp.'s Data Services Group.
- David E. McKinney has been appointed president of IBM's Information Records Division.
- Dr. C. Lester Hogan has been elected to the board of directors of Tab Products Co.
- John Kason, executive vice-president of University Computing Co., has been named chief operating officer.
- Arnold D. Palley has been named executive vice-president of Brandon Applied Systems, Inc. and Gary L. Slaughter has been named president of Brandon Systems Institute, Inc.
- Richard W. Snyder has been elected chief executive officer and Jean-Francois Augier has been elected a member of the board of General Computer Systems, Inc.
- Stephen A. Grosky has been named vice-president and general manager of the Commercial Systems Division at Bunker Ramo Corp.'s Information Systems Division.
- Tommy W. Drum has been named vice-president of CATV and general services of Cox Data Systems.
- Robert R. Benz has been named vice-president of operations of the Lease Marketing Division of Itel Corp.'s Data Products Group.
- Ephraim Gitelman has been appointed vice-president of operations at Computek, Inc.
- Terry W. Smith, James J. Formosa Jr. and David Perdue have been named vice-presidents of sales and marketing, operations and systems and programming, respectively, at Data Service Corp.

Correction

Microline Corp. named two vice-presidents recently: Derek Richell will head Product Management, and James D. Wylie will take charge of marketing.

Curbs Tax Incentives

House Unit Votes Revised 'Disc' Plan

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The House Ways and Means Committee has voted to curb sharply – rather than kill entirely – the tax incentives offered firms who export manufactured goods through a domestic international sales corporation (Disc).

Under the Disc program, American firms have been permitted to set up separate subsidiaries to handle exports. One-half of the income earned from these overseas shipments can be deferred indefinitely.

During hearings this summer, industry officials testified elimination of the Disc program could have a serious impact on U.S. exports at a time when companies face serious cash flow problems and capital shortages [CW, July 23].

The approved proposal, offered by Rep. Joseph Karth (D-Minn.), offers tax incentives on about 25% rather than 100% of income earned through a firm's Disc organization.

Under Karth's plan, a firm would average its Disc income during the base period of 1972, 1973 and 1974 to determine its base taxable income.

The first 75% of that Disc income would be taxable and payable at once, like normal taxes.

For example, if Company X had an average Disc income of $10 million for that three-year period, 75% of that income, or $7.5 million, would be taxed this year as normal income.

The firm could then defer 50% of the taxes due on the $2.5 million balance.

Five-Year Base

Once a company has established its base figure, the base would remain in effect for five years, whether income goes up or down.

After that, the base would be recomputed each year by dropping the earliest year's income and adding one at the other end. The first reaveraging would be done by dropping 1972's Disc income figure and adding 1975's, for example.

Small exporters – those with export profits under $100,000 – would still be permitted to defer 50% of taxes due on their total Disc incomes.

Deferrals under the revised Disc Program will continue to be allowed for an indefinite period, and no provision was included to require repayment of any taxes previously deferred, despite the strong objections of the Ways and Means chairman Al Ullman (D-Ore.).

Repeal Proposal Rejected

The committee defeated by a vote of 7 to 29 a motion offered by Sam Gibbons (D-Fla.) that would have repealed the Disc program entirely and required companies that had deferred taxes under the Disc program to repay them over a 10-year period.

Jack Biddle, president of the Computer Industry Association, expressed mixed feelings on the committee's action.

"We are pleased the House Ways and Means Committee has seen the importance of the Disc provision to the smaller companies in America that export their products," he said.

"The Disc is not a tax loophole, but rather a means of keeping U.S. dollars within the U.S. and creating numerous jobs for American citizens, he explained.

"We will continue to work with the committee and hope the complete provision will be restored and even enhanced so that a strong, viable computer and data processing industry can profitably manufacture its products in the U.S. for export abroad," he said.

The measure will be considered by the full House and the Senate Finance Committee.

Basic Four Likes Rivalry In Small Business Mart

By Molly Upton
Of the CW Staff

IRVINE, Calif. – Basic Four Corp.'s vice-president of marketing is happy to see increased competition in the small business marketplace.

"Each time a competitor comes in, our sales increase," George Erickson said.

"Competition stimulates activity and awareness" in the small business machines market, he added.

Basic Four's business is improved in 1975 over 1974, he said, and the firm has expanded its marketing and distributing force.

There has been a definite upward surge since December, he said, with direct and dealer sales split about 50-50, he said.

Basic Four's method of using service bureaus and software firms to act as dealers gives the firm a balance. It has control over sales through its direct sales force, and the dealers facilitate expansion into different geographical areas, according to Don Schnitter, director of marketing services.

Two-Way Marketing

Although Basic Four has traditionally marketed to the small businessman with its enhanced and larger Model 600, the firm is approaching larger firms that need distributed processing, Erickson said.

Some firms are marketing distributed systems to either a company's corporate headquarters or its branches. Basic Four is marketing its Model 600 both ways, Erickson said.

"We have to be able to talk with field offices to learn their needs and with corporate headquarters for direction on other aspects of the system," he said.

The needs of the 600 marketplace are somewhat different than those of the smaller business market, Erickson added. The unit needs to be compatible with other DP functions and also have greater versatility, since corporate executives may be looking at how the system might be used differently in the future, he said.

In addition, the 600 will need a wider variety of periphrals in the future, he predicted.

Basic Four was one of the first firms to direct its customers to independent software suppliers, many of whom are dealers, Erickson said.

The firm offers customers two options: to go with an independent software firm recommended by Basic Four and pay 100% of the cost or to contract through Basic Four, which will be responsible for the software development, and pay 120% of the cost, Schnitter explained.

In the latter case, Basic Four selects the software supplier. About 60% of customers now choose this approach, he said.

The firm has a catalog of packages developed for the Basic Four system. Many of these are oriented toward a specific line of business, such as bottled gas distributing. In these cases, the users often help sell Basic Four to other firms in the industry, he observed.

In addition, Basic Four offers a Comprehensive Business System which consists of five modules. Generally this software is used within the wholesale/distribution industry, but a lot of people buy it and add to it or tailor it.

The firm also has some packages it developed for specific industries, such as real estate brokers, tour operators, fuel distributors, lawyers and certified public accountants, he said.

Service Firms Urged to Safeguard Privacy of Personal Information

MONTVALE, N.J. – Computer service companies should analyze their own operations and take reasonable steps to safeguard the privacy of the personal information they handle before "ill-considered regulatory action" is taken, the Association of Data Processing Service Organizations (Adapso) said in a recent position paper.

Entitled "The Right to Privacy: Industry's Responsibility," the paper urged service companies to:

- Ensure the existence of any personnel data recordkeeping system is not kept secret unnecessarily.
- Permit an individual to find out, when appropriate, what information about him is in a record and how it is used.
- Allow an individual to prevent information about him that was obtained for one purpose from being improperly used for another purpose without his consent.
- Permit an individual, when appropriate, to correct or amend a record of identifiable information about him.
- Assure the reliability of data for its intended use and prevent the misuse of such data.

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Software House Finds Specializing Secret to Success

ATLANTA – Do what you do best. Do one thing and do it very well. Enhance a company's strengths; don't just keep up with the industry.

Those maxims are the secret to success, according to John Imlay, president of Management Science America, Inc. (MSA), which designs, develops, maintains and markets financial application packages.

The secret must work, at least for MSA, which came back from Chapter X bankruptcy in 1971 to revenues of $6.2 million in 1974. Imlay expects MSA to top $8 million this year.

Scratching the Surface

"We haven't scratched the surface yet as far as customers are concerned," he said. "We do over $2 million a year in business with banks, but general industry is still virtually untapped."

The prospect base was 2.5 million in 1971. This figure has risen to 18 million, Imlay said.

"We believe our present base of 1,700 customers is just the tip of the iceberg in terms of the market potential," Imlay said. "In many ways MSA's future is tied closely to that of our industry.

"For years the credibility of [packaged] software was poor because many companies promised more than they could deliver. Most of those companies are gone now and most of those remaining do offer competitive packages," he said.

"As a result, the credibility of the industry has grown tremendously over the past three years and, with credibility, product acceptance has come."

MSA currently markets nine packages: payroll, personnel management; fixed-asset accounting; general ledger; accounts payable; financial information and control; supplies inventory control and purchasing; Alltax; and AR 70, a newly acquired accounts receivable system.

MSA has no plans to diversify its offerings into other markets, Imlay said. Rather, it will stick to packages which handle standard accounting functions of today's corporations.

While MSA has sold packages to replace other products, the main thrust of marketing is to replace an in-house system with a standard MSA package, freeing up in-house DP staff for more creative programming.

"Most companies have an in-house payroll system, for instance," Imlay said, "but, as the Equal Employment Opportunities Commission personnel reporting and tax requirements change, they come to us.

"We will maintain the system over the years and all tax changes are provided through the maintenance plan. The same is true of our general ledger package."

While MSA does tailor its packages to suit the needs of specific industries such as banking or insurance, it does little customizing for individual companies.

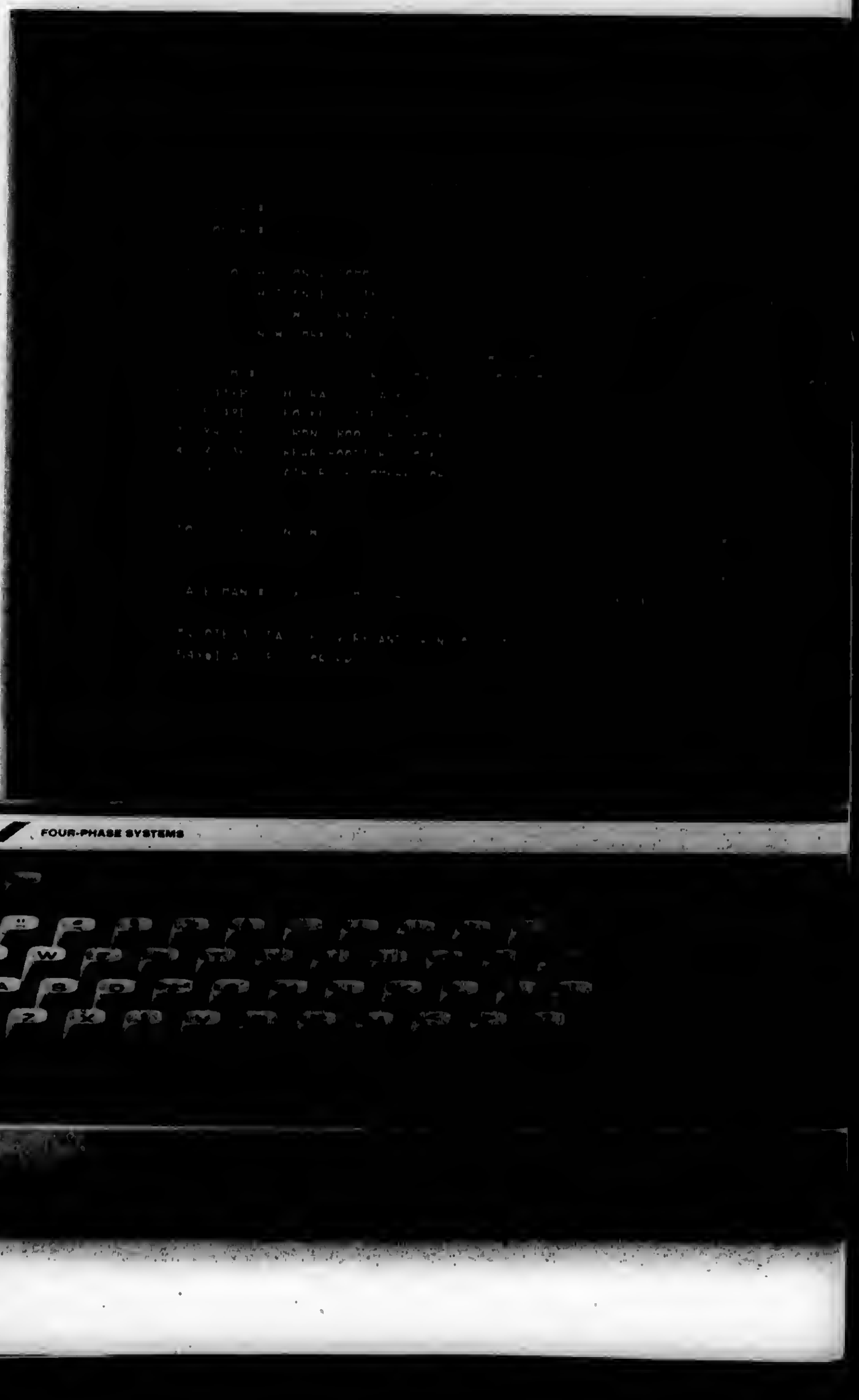
For example, because of the graphs required by the insurance industry, MSA has developed a special graphing feature for the insurance field, Imlay said.

The company is currently looking at the possibility of expanding into the minicomputer field and into foreign markets.

Imlay expects to enter the mini software market within the next year since "minis are the way of the future."

He also anticipates opening an office in Great Britain by next March. The company is currently surveying the market there, he said.

"So far the main worry is the difference in payroll systems between the U.S. and Great Britain, which may necessitate extensive changes in our standard package," Imlay said.



Handprint Reader Now Under Test

NEW YORK – Information International, Inc. has begun testing its Grafix 1 system for use in reading clerical handprinting as a means to computerizing a health insurance system, Alfred L. Fenaughty, president of the company, said here recently.

"The first Grafix system was installed for the U.S. Navy in Florida, where it is being used to update and republish 17,000 volumes of critical aircraft maintenance instructions," he said.

"In that application, data is being entered into the computer, without keypunching, by direct scanning of page images.

"After capturing written information, illustrations and halftones, a technical editor has access to any page within 10 sec and can edit or add material via CRT terminal. The material may then be republished automatically," he said.

Firm Markets Leads

ROCKVILLE, Md. – Ever hanker after the leads another firm found but was unwilling to follow up on?

Benchmark Marketing Corp. is offering a service that collects leads picked up by salesmen and funnels the information to four vendors per category.

Benchmark is at 4708 Hornbeam Drive, Rockville, Md. 20853.

CDI Sees Miniterm in Its Future

NEW YORK – Computer Devices, Inc. (CDI) is incorporating its Q3 thermal matrix print mechanism into its line of printers.

The Q3 will appear in the Miniterm, a 17-lb "movable" keyboard printer with an RS-232C interface, Ken Wright, CDI president, said in a recent interview here.

The Miniterm is but one of a new line of products coming from CDI, which is having its best year ever in terms of revenues and profits, he said.

The Q3 "was announced prematurely," he admitted, the firm expects to produce the Miniterm the first of next year.

Although most of CDI's current products are portable printers with acoustic couplers, in keeping with the standard industry definition of this type of product, the very light Miniterm will lack the coupler.

The single quantity price will be $1,750.

Astronautics Wins GSA Terminal Bid

Astronautics Corp. has been awarded a contract for computer communications terminals by the U.S. General Services Administration (GSA).

The contract has a potential dollar value of $70 million based on the government's user needs over the eight-year contract life, according to Theodore D. Puckorious, commissioner of the GSA Automated Data and Telecommunications Service.

Other Awards

On-Line Systems, Inc. has received a five-year contract for computer services from Dynabank Corp. for an undisclosed sum.

Pertec Corp. has received a contract valued at more than $3 million from Interdata, Inc. to supply magnetic tape drives, disk drives and flexible disk drives. The firm also received a $1 million contract from the Computer Special Systems Division of Digital Equipment Corp. for Pertec's T-9000 vacuum column tape transports.

Contracts

Sycor, Inc. has been awarded a $1.3 million contract from National Car Rental System, Inc. for 152 Model 350 flexible disk terminal systems to be used at National's car rental locations.

Pacific Northwest Bell Telephone Co. has signed a five-year lease contract with Computer Systems of America, Inc. for a $1.1 million Bunker Ramo data terminal system. Installed in various telephone company branch offices throughout Oregon and Washington since 1972, the equipment was originally leased directly from Bunker Ramo.

Delphi Associates, Inc. has received two contracts totaling $750,000 from the states of Georgia and New Hampshire for the management systems design of two different types of welfare and Medicaid information systems.

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Instant access of obsolete data isn't very useful. That's why we've given Version 3 online update capability. Now all your operators can access the same current information. As each transaction is keyed, master file records can be updated *automatically*. For example, when new orders are entered, inventory records can be updated to show the reduced quantity on hand. And when warehouse receipts are entered, inventory records can be revised to show the newly arrived stock. It's all automatic with Version 3.

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ORANGE, Calif. – Marketing Concepts Co. has been established here to help generate business for growth-potential computer and other electronics companies in the Orange County area.

Services will include advertising, product literature, direct mail, publicity, trade shows – "the gamut of market promotion needs directed toward building sales," according to Gene Sylvester, who started the firm after seven years at Lockheed Electronics' Data Products Division.

MDB Systems, an independent manufacturer of minicomputer interfaces and general-purpose modules, an exhibit house with numerous electronics clients and a company that creates large color photo reproductions for commercial interiors using optical scanning techniques have already signed on, according to Sylvester.

The company address is Box 1427, 92668.

Management Firm Set For DP-Related Groups

ROLLING MEADOWS, Ill. – A firm specializing in the administrative management of computer-related associations and societies has been formed by Donn W. Sanford, former executive director of the Data Processing Management Association.

The Sanford Organization, Inc. will provide a complete range of professional management services, primarily for small to medium-size groups, according to Sanford.

"The Sanford Organization was formed," he said, "in response to the growing need of computer-related associations and societies to utilize professional management firms to implement needed programs, increase efficiency and better serve members through more effective use of dues income."

The firm is at 3315 Algonquin Road, 60008.

Maisonrouge Says

IBM Plans No Revolution in Future Gear

PARIS – "We are working toward future machines, there is no doubt . . . But does that mean an extraordinary revolution?"

Not according to Jacques Maisonrouge, senior vice-president of IBM Corp. and head of IBM World Trade Europe-Middle East-Africa.

One reason for this, which would be sufficient in itself and relates strictly to commercial constraints without even considering the technical constraints, is the weight of the software investment customers have made, Maisonrouge said in a report in *Zero-Un Informatique*.

He noted the difficulties which had been encountered by both IBM and users in the change from the 1401 to the 360.

"That is why, for the future, we think it is preferable to conceive an evolutionary system rather than a system which will create a rupture and force clients to reinvest considerable funds in programming," Maisonrouge said.

"Everyone knows the difficulties which are encountered in going from one system to another when they are not compatible," he said. "So we want to spare our customers from them.

"But, I repeat, in respect to the famous Future Series, there has not been, contrary to what some newspaper articles have led one to believe, any discontinuity in our effort.

"There has been a reorientation of certain programs," Maisonrouge concluded.

International News

Rank Pulling Out Of CPU Market

LONDON – Rank Organisation, which markets Xerox Computers in Europe, has decided to pull out of the mainframe business and concentrate on copiers.

General Manager Stephen Foster said he would like to see both the Xerox Data Systems Division and Rank Xerox Data Systems (RXDS) sold as a single and going concern, according to an article in *Computer Weekly*.

RXDS would not be keen on entering a partnership with any company that might buy the Xerox unit, Foster explained, since that company would likely have international marketing.

Hitachi, CDC Thinking About Joint Venture

TOKYO – Hitachi and Control Data Corp. are discussing a possible joint venture activity, a CDC spokesman said, confirming a report in *EDP Japan Report*.

But there has been no real resolution of any particular issues, he cautioned.

One of the projects the report said is in the wind is joint development of terminal equipment to compete with IBM's System Network Architecture line.

The report also mentioned speculation that CDC would market Hitachi's M170 and M180 in the U.S., while Hitachi might become a distributor of CDC peripherals and terminals in Japan.

Yearbook for Asia Due

HONG KONG – The first computer yearbook for Asia will be published and available from the Computer Yearbook and the Hong Kong Computer Society by the end of the year.

It will contain a business directory of computers and computer services.

The yearbook will also contain population figures for computers in use in Asia.

The book will retail for $10, including air mail postage to anywhere in the world.

Computer Yearbook is located at A-118 Macdonnell Road.

Nixdorf Unveils 3600 Competitor

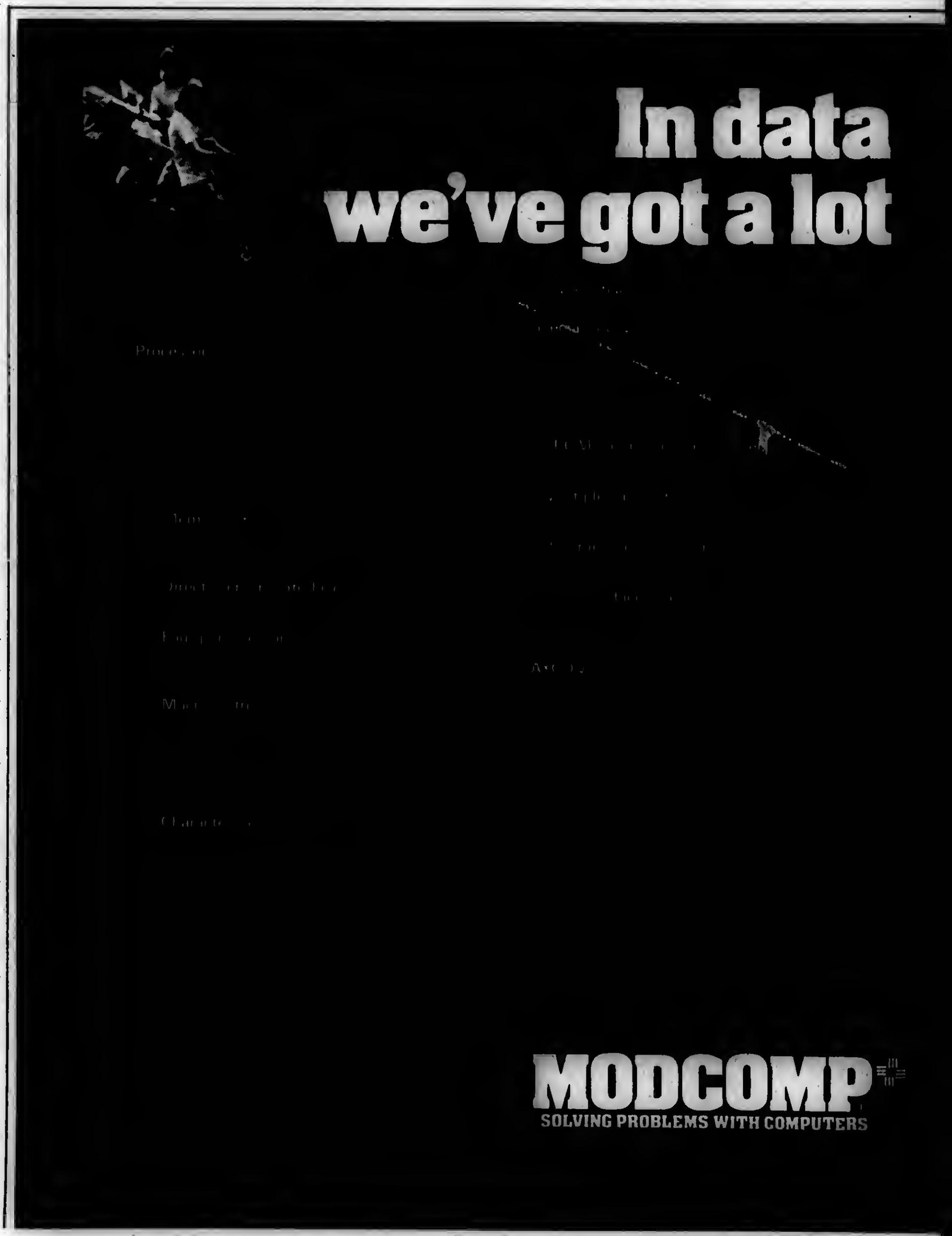
PADERBORN, W. Germany – Nixdorf has unveiled the 8864 bank terminal system, which has been hailed as a challenge to the IBM 3600 series by the newspaper, *Computer Weekly*.

The 8864 has a 64K-byte CPU specially designed for the system which allocates 32K bytes to custom-designed programs.

The processor, printer and CRT cost about $24,000. The processor can handle up to four floppy disk units, and disk drives will be available next year.

Nixdorf also announced two automatic cash dispensers, but has no plans for an automatic transaction terminal that would handle cash issuing deposits, transfers and statements in one service, the article said.

Nixdorf terminals are linked to an 8864 or a network of 8864s to a large mainframe on a point-to-point basis rather than a closed-loop circuit.





This simulator system for terminal and sir traffic control will be installed in the USSR by Stansaab Elektronik AB.

Soviets Pay $70 Million For Stansaab Air System

MOSCOW -- The Soviet Union has purchased an advanced simulator system for terminal and air traffic control from Stansaab Elektronik AB of Sweden for an estimated $70 million.

The Terminal and Enroute Control Automated System will consist of four operational air traffic control systems, terminal control centers (TCC) near Moscow, Kiev and Mineral'nyje Vody and an area control center adjacent to the Moscow TCC.

Delivery will begin in 1976, with Stansaab responsible for the design, supply and installation of the complete system package comprising computers, displays, radar, communications, buildings, standby power supplies and all ancillary services including training and maintenance support.

Other Orders, Installations

Intercab, Inc., a Canadian taxi fleet operator, has ordered a computerized vehicle dispatch system based on a 32K Data General Nova 1200 minicomputer.

Computer Centrum Twente, a computer service bureau in The Netherlands, has ordered a California Computer Products, Inc. 2130 system to add microfiche capability to customer service in the eastern part of The Netherlands and western Germany.

Ampex Corp. will install a Video File Information System for the Metropolitan Police at New Scotland Yard in London to assist in fingerprint identification.

The Dublin Savings Bank has installed an on-line financial system consisting of NCR 270 financial terminals linked to an NCR Century 101.

Yamamoto Sangyo Co. Ltd., a Japanese steel trading company, has installed a Univac 1106 computer system.

Iran National Airlines Corp. has ordered PTS-100 programmable data display systems from Raytheon Data Systems for its domestic and international reservation system. Raytheon is initially supplying 119 terminals with another 52 terminals to be delivered later.

The European Center for Medium Range Weather Forecasts, set up by 16 European nations, has ordered a Control Data Corp. CDC 6600 computer system to support research into numerical methods of making weather forecasts.

Hasler AG of Bern, a Swiss manufacturing concern, has ordered a Univac 1110 computer system and the DMS-1100 data base management system to construct an integrated information system.

Bonnierdata AB of Stockholm, Sweden has ordered the CCP communications processor from Chi Corp.

The Instituto G. Donegani, an Italian research institute, has installed a Univac 1106 computer system to process data for simulation studies in chemical research.

Societe Industrielle Aerospatiale, a French participant in development of the Concorde supersonic jet transport, has ordered a Cyber 172 computer system from Control Data Corp.

Foreign Orders & Installations

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Qualified applicants must meet the following requirements:

- Bachelors degree in Computer Sciences, Management, or related discipline.
- Minimum seven years computer experience, including some experience on a large scale terminal communications system, and some management and supervisory experience at the Associate Director or Director level. A Masters degree would require five years of the above experience.
- Understanding and experience with budgetary and financial matters.
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- Work effectively with top management and senior people in universities and community.

Send resume and salary history by October 29th, 1975 to:

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Large, rapidly growing L.A. law firm seeks person with background in D.P., preferably IBM System 3 experience, and some knowledge of accounting to become O.P. Manager and Assistant Controller. Some COBOL programming experience desirable.

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A major heavy contracting firm is seeking a qualified data processing manager well versed in RPG and Fortran. Must be qualified to direct department and capable of systems designs and systems analysis. Five years experience preferred with degree in computer science.

Forward resume with salary requirements to:
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Send resume and salary history to: Amy Shepard, ABT Associates Inc., 55 Wheeler Street, Cambridge, Mass. 02138 (principals only).

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It is enticipated that the Coordinator will become the director of the cooperative if the study proves that the cooperative is faesible and desireble, end if appropriete funding is availabla. Currently funded to September 1, 1976, with annual renewals expected.

KNOWLEDGE, ABILITIES AND SKILLS: Must have excellent communications and interpersonal skills — with an emphasis on the preparation of technical reports; considerable computer-related management experience, preferably in an educational environment; thorough knowledge of the problems and benefits associated with the shared use of computer resources.

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Senior Programmer Analyst

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Senior Programmer Analyst II:

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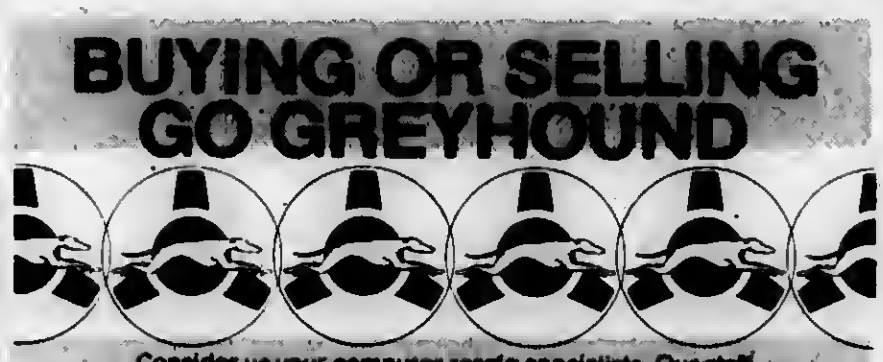
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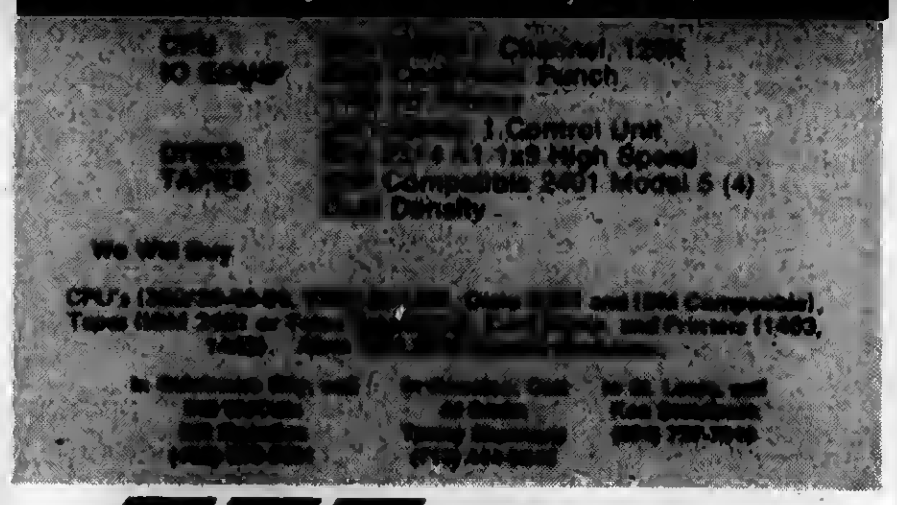


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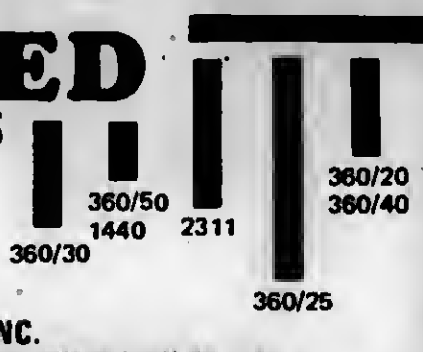
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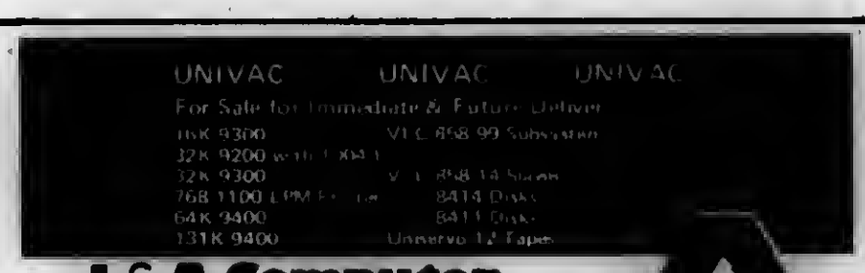
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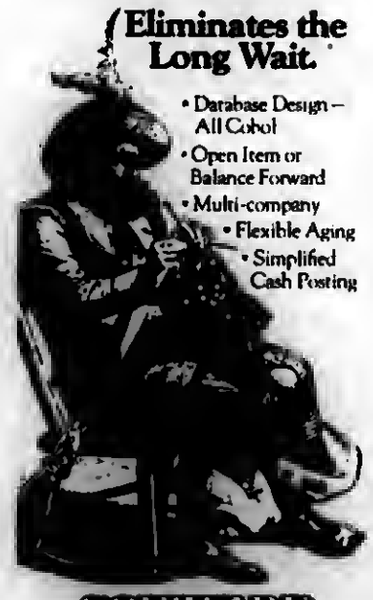
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One Year After Shake-Up

Keydata '75 Earnings in Plus Column

WELLESLEY, Mass. – One year after a shake-up that replaced Keydata Corp.'s president and three out of four vice-presidents, the time-sharing firm reported a $1 million turnaround in pretax income and a 15% rise in revenues over 1974.

Net income for fiscal year 1975, which ended July 31, was $452,000 or 17 cents per share, including a $200,000 extraordinary credit, on revenues of $13.5 million. This compares with a net loss of $2.9 million on revenues of $11.7 million.

The loss for fiscal 1974 was the result of a $587,000 operating loss and a special charge of $2.4 million resulting from a change in accounting methods.

L. Edwin Donegan Jr., president of the 10-year-old firm specializing in service to distributors and manufacturers, said improvements in the company's financial picture were the result of "a combination of stringent cost controls and an increase in business volume."

Calcomp Finishes Year in Red, Cites Braegen Write-Offs for Loss

ANAHEIM, Calif. – California Computer Products, Inc. (Calcomp) reported results for fiscal 1975, ended June 30, in red ink with a loss of $12.4 million on revenues of $122.9 million.

Last year the firm netted $8.7 million on revenues of $129.9 million.

Net loss per share was $3.83, compared to net earnings per share of $2.84 a year earlier.

Calcomp President Lester L. Kilpatrick attributed about two-thirds of the 1975 loss to a write-off of its investment in The Braegen Corp. and abandonment of Braegen's intelligent terminal systems.

These investments were made in anticipation of an agreement to purchase the firm, but "it became evident in a tight money market that capital required to make the acquisition profitable in the long term could be more judiciously used elsewhere," he said.

Revenues Higher, But Earnings Dip In National Semiconductor Quarter

SANTA CLARA, Calif. – National Semiconductor Corp. reported first-quarter earnings of $5.2 million or 40 cents a share on revenues of $82.4 million for the period ending Sept. 21.

The results compare with earnings of $5.5 million or 46 cents a share on revenues of $75.1 million in the year-ago period.

Sales were up 10% compared with the same period last year, according to Charles E. Sporck, National Semiconductor president.

Sporck noted sales in every major product family increased in the first quarter over the previous quarter and the company's weekly rate of total sales was 8% above the weekly rate in the previous quarter.

Commenting on the lower rate of profit, Sporck said the firm's sales were proportionally higher during the first quarter for handheld calculators, but competitive conditions resulted in lower profit margins.

CCI Year 'Successful' Despite Loss

TORRANCE, Calif. – Computer Communications, Inc.'s 1975 earnings dropped to $16,552 or 1 cent a share compared with $477,820 or 20 cents a share in 1974.

Revenues also dipped, to $4.5 million from $4.6 million last year.

Pretax income dropped from $477,820 to $16,552.

CCI President Raymond E. High noted that, in view of the prevailing adverse economic climate and the concurrent development of the company's enhanced communications product line, fiscal 1975 would have to be considered a success.

New orders, including the recently announced multimillion dollar three-year equipment purchase agreement with Memorex Corp., have generated the largest backlog in the company's nine-year history and provides a strong base for the future, he added.

DPF Plans to Invest $50 Million in 370s

WHITE PLAINS – DPF, Inc. has announced a campaign to invest up to $50 million in IBM 370 equipment to reverse its trend of declining computer leasing revenues.

Most of the equipment is expected to come from users and used computer dealers, according to Bertram J. Cohn, the company's chairman and chief executive officer.

The company said 97% of its 360 portfolio, which was valued at about $22 million at original cost, is now under firm term lease contracts totaling about $30 million.

At year-end, the book value of the 360 inventory was written down to about $33 million.

Acquisitions

Storage Technology Corp. has acquired Ultimacc Systems, Ine., a Maywood, N.J. firm, as a wholly owned subsidiary.

Data 100 Corp. has acquired Iomee, Inc. by exchanging 80,000 of its common shares with substantially all of Iomec's 3.4 million outstanding common shares. The transaction will be accounted for as a purchase and is not expected to dilute Data 100's 1975 earnings, Edward D. Orenstein, Data 100 president, said.

Daniel, Mann, Johnson and Mendenhall, international architects and planners, has acquired Logieomp Corp. of Los Angeles as a wholly owned subsidiary.

3M Co. has agreed in principle to acquire the Graphic Systems Division of Gould, Ine. of Newton, Mass., for approximately $5 million.

On-Line Systems, Ine. has agreed to acquire Leasco Response Ltd., Reliance Group, Inc.'s time-sharing subsidiary in the UK. The purchase price was for an undisclosed amount financed from On-Line Systems' working capltal.

The Computer Exehange in Great Neck, N.Y., has acquired approximately 99% of the outstanding shares of common stock of Systems Resourees Corp. in exchange for 197,853 shares of Computer Exchange common.

Systematies, Ine. of Little Rock, Ark., has announced the acquisition of Sys Con, Ine. of Grand Rapids, Mich., to gain a fifth center in the Michigan area and strengthen its software position.

Computer Usage Co. of San Francisco has acquired the Singer Co.'s Sunnyvale DP Service Center for an undisclosed amount of cash.

Itel Corp. has acquired Central Data System, Ine., a Cleveland DP firm, for $3.5 million.

Informaties, Ine. has purchased the stock of Informaties PMI, Ine., from General Telephone and Electronics Corp.

Automatic Data Processing, Ine. has reached an agreement in principal to acquire Flnaneial Computer Services, ine. of Fremont, Ohio, for $1.9 million in cash.

Chemtron Corp., a firm that sells carbon dioxide and Halon 1301 systems, has acquired Fire Control Engineering Co. of Fort Worth, Texas for an undisclosed amount of cash.

Earnings Reports

NATIONAL CSS
Three Months Ended Aug. 31

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Shr Ernd	$.45	$.45
Revenue	8,657,450	8,430,913
Earnings	481,700	489,800
6 Mo Shr	.91	.88
Revenue	17,257,100	16,661,095
Earnings	993,000	961,900

ELECTRONIC TABULATING
Six Months Ended June 30

	1975	1974
Shr Ernd	$.37	$.31
Revenue	1,565,200	1,400,178
Earnings	159,444	131,984

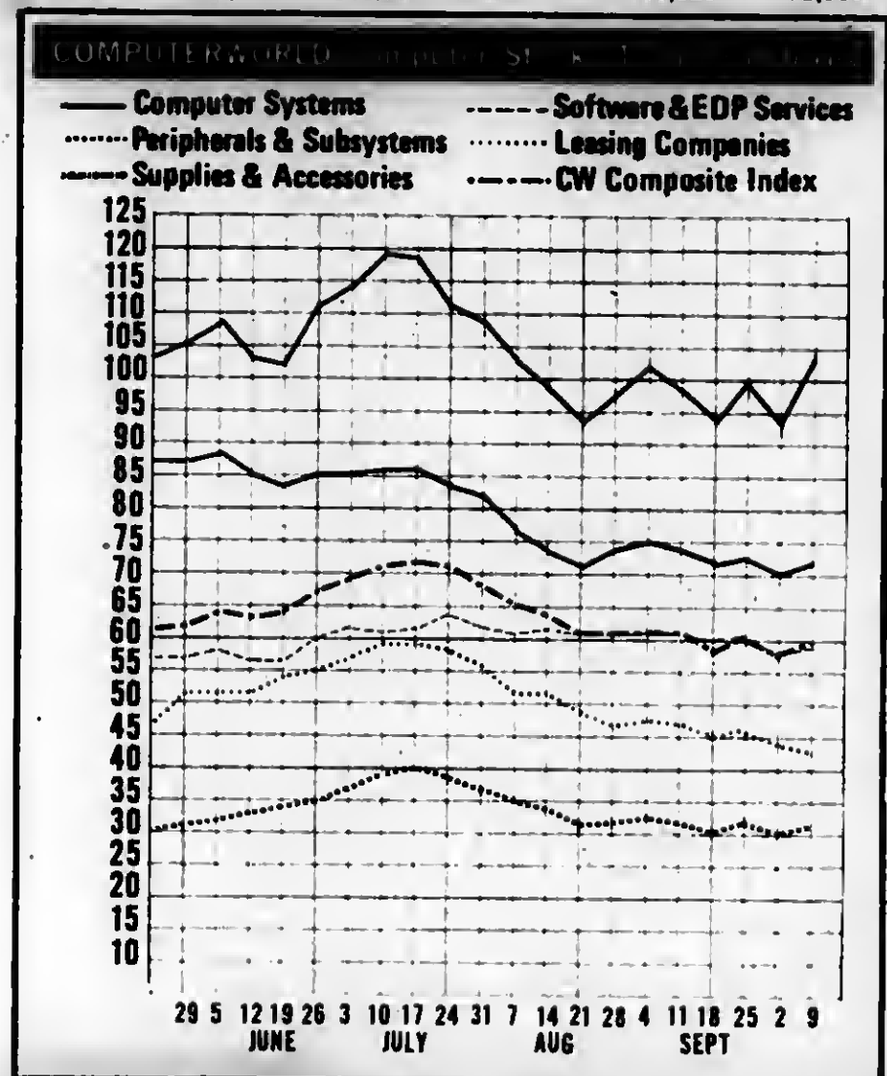
MATHEMATICA
Year Ended June 30

	a1975	1974
Shr Ernd	$.71	$.91
Revenue	14,839,000	11,817,000
Spec Cred	b(49,300)	49,200
Earnings	494,200	633,700

a-Program development costs charged against income. b-Loss from sale of bonds.

COMPUTER INSTRUMENTS
Six Months Ended July 18

	1975	1974
Revenue	$2,720,632	$2,720,626
Loss	46,320	72,338



TAB PROOUCTS
Three Months Ended Aug. 31

	1975	a1974
Shr Ernd	$.24	$.46
Revenue	8,603,000	8,663,000
Earnings	200,000	384,000

a-Restated.

APPLIED DIGITAL DATA
Three Months Ended Aug. 31

	1975	1974
Shr Ernd	$.23	$.20
Revenue	4,676,408	$2,410,854
Tax Cred	.....	a326,000
Earnings	861,174	738,702
9 Mo Shr	.57	.52
Revenue	11,825,967	6,418,171
Tax Cred	.....	a989,000
Earnings	2,136,278	1,960,175

a-Tax-loss carryforward.

CALIFORNIA COMPUTER PRODUCTS
Year Ended June 30

	1975 (000)	1974 (000)
Shr Ernd	.....	$2.42
Revenue	$122,903	129,906
Tax Cred	.....	3,300
Earnings	(12,393)	8,670

COMPUSCAN
Three Months Ended Aug. 31

	1975	1974
Shr Ernd	$.21	$.16
Revenue	2,796,000	2,138,000
Tax Cred	159,000	107,000
Earnings	351,000	247,000

GENERAL INSTRUMENT
Three Months Ended Aug. 31

	1975	1974
Shr Ernd	$.17	a$.53
Revenue	96,156,428	115,187,491
Earnings	1,631,759	4,174,958
6 Mo Shr	.24	a.96
Revenue	185,405,027	226,558,673
Earnings	2,499,822	7,608,023

a-Adjusted for a 2% stock dividend in May 1975.

SYSTEMS ENGINEERING LABS
Year Ended June 27

	1975	1974
Revenue	$17,457,664	$14,950,971
Spec Item	a135,871	b1,336,088
Loss	321,889	3,711,988
3 Mo Rev	4,224,238	4,856,921
Spec Item	a135,871	d(3,825)
Loss	32,732	136,149

a-Tax credit. b-Gain on sale of land. d-Loss on sale of land.

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1. Title of publication: Computerworld
2. Date of filing: September 29, 1975.
3. Frequency of issue: Weekly (except: a single combined issue for the last week in December and the first week in January).
3a. Annual Subscription Price: $12.00
4. Location of known office of publication: 797 Washington St., Newtonville, Mass. 02160. (Middlesex County).
5. Location of the headquarters or general business offices of the publishers: 797 Washington St., Newtonville, Mass. 02160.
6. Names and addresses of the publisher, editor and managing editor: Publisher, Patrick J. McGovern, 797 Washington St., Newtonville, Mass. 02160. Editor, E. Drake Lundell, 797 Washington St., Newtonville, Mass. 02160. Managing Editor, none.
7. Owner, Computerworld, Inc., 797 Washington St., Newtonville, Mass. 02160. Stockholders owning or holding 1% or more of total amount of stock: International Data Corp., 214 Third Ave., Waltham, Mass. 02154.
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10. For completion by nonprofit organizations authorized to mail at special rates: Not applicable.
11. Extent and nature of circulation:

	Average No. Copies Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
A. Total number of copies printed (net press run)	71,041	72,720
B. Paid circulation		
1. Sales through dealers and carriers, street vendors and counter sales	none	none
2. Mail subscriptions	66,668	68,153
C. Total paid circulation	66,668	68,153
D. Free distribution by mail, carrier or other means, samples, complimentary and other free copies	2,455	2,837
E. Total distribution (Sum of C and D)	69,123	70,990
F. Copies not distributed		
1. Office use, left-over, unaccounted, spoiled after printing	1,918	1,730
2. Returns from new agents	none	none
G. Total (Sum of E and F – should equal run shown in A)	71,041	72,720

I certify that the statements made by me above are correct and complete.
Signed: W. Walter Boyd
President

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 8, 1975

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE III	CLOSE OCT 8 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	96 1/4	+9 7/8	+11.4
O	COMPUTER AUTOMATION	2- 10	9 3/4	+1 1/2	+18.1
N	CONTROL DATA CORP	11- 23	19 3/8	+2 3/4	+16.9
N	DATA GENERAL CORP	10- 38	36 5/8	+8 1/2	+30.2
O	DATAPOINT CORP	6- 26	23 1/4	+3 1/4	+16.2
O	DIGITAL COMP CONTROL	1- 4	2 3/4	+ 1/4	+10.0
N	DIGITAL EQUIPMENT	46-130	129 1/2	+17 3/4	+15.8
N	ELECTRONIC ASSOC.	2- 3	2 1/8	- 1/8	-5.5
A	ELECTRONIC ENGINEER.	5- 10	8 3/8	- 3/8	-4.2
N	FOXBORO	23- 42	26 7/8	+2 1/8	+8.5
O	GENERAL AUTOMATION	6- 14	9 5/8	- 3/4	-11.7
O	GRI COMPUTER CORP	1- 1	5/8	+ 1/8	+25.0
N	HEWLETT-PACKARD CO	58-120	103 3/8	+8 3/4	+9.2
N	HONEYWELL INC	22- 40	30	+2 3/8	+8.5
N	IBM	158-224	206	+22 3/8	+12.3
O	MEMOREX	1- 10	9 3/4	+3 1/8	+47.1
O	MICRODATA CORP	2- 6	5 5/8	- 1/8	-2.1
O	MODULAR COMPUTER SYS	5- 19	11 1/4	- 1/4	-2.1
N	NCR	15- 39	24 1/2	- 1/4	-1.0
O	PRIME COMPUTER INC	2- 6	4 3/4	0	0.0
N	PERRIN-ELMER	16- 30	24 1/8	+2	+9.0
N	RAYTHEON CO	26- 59	53 1/2	+3 3/4	+7.5
N	SINGER COMPANY	10- 17	11 1/8	+ 1/8	+1.1
N	SPERRY RAND	26- 49	42 5/8	+3 7/8	+10.0
A	SYSTEMS ENG. LABS	1- 9	3 1/8	0	0.0
N	VARIAN ASSOCIATES	7- 15	14 3/4	+1 3/8	+13.2
N	WANG LABS.	7- 17	10 7/8	+1 9/8	+17.5
N	XEROX CORP	51- 86	98 3/4	+5 1/2	+10.3
	LEASING COMPANIES				
O	CONDISCO INC	1- 5	3 3/8	0	0.0
A	COMPPCE GROUP CORP	2- 4	2 1/2	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	5/8	0	0.0
N	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	0- 1	3/8	-	-12.4
N	DPF INC	3- 6	4 5/8	+ 1/8	+2.7
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/8	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 1/2	- 3/8	-13.0
A	ITEL	3- 9	6 1/2	+ 7/8	+15.5
N	LEASCO CORP	4- 8	6 7/8	+ 3/8	+5.7
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NPC INC	0- 4	3/4	+ 1/8	+20.0
A	PIONEER TFR CORP	2- 7	5 1/2	+ 3/8	+7.3
A	ROCKWOOD COMPUTER	1- 1	1/8	- 1/8	-50.0
N	U.S. LEASING	7- 14	6 1/2	0	0.0

EXCH		1975 RANGE III	CLOSE OCT 8 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	3/4	0	0.0
A	APPLIED DATA RES.	1- 10	1 5/8	0	0.0
N	AUTOMATIC DATA PROC	29- 65	53 1/2	+6 1/2	+13.8
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	CENTRAL DATA SYSTEMS	3- 7	7 3/8	+ 1/8	+1.7
O	COMPUTER DIMENSIONS	2- 6	3	0	0.0
O	COMP ELECTION SYSTMS	3- 6	9 3/4	+1	+21.0
O	COMPUTER HORIZONS	1- 1	7/8	0	0.0
O	COMPUTER NETWORK	1- 3	2 5/8	0	0.0
N	COMPUTER SCIENCES	2- 6	5	0	0.0
O	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
O	COMPUTER USAGE	2- 4	2 1/8	+ 1/8	+6.2
O	COMSHARE	3- 4	2 9/8	0	0.0
O	DATA48	1- 2	1 1/8	0	0.0
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	15 1/4	- 1/4	-1.6
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	9/8	0	0.0
O	KEANE ASSOCIATES	2- 3	2	0	0.0
O	REYDATA CORP	2- 3	2	0	0.0
O	LOGICON	3- 5	3 3/8	- 3/8	-10.0
A	MANAGEMENT DATA	1- 3	1 3/4	0	0.0
O	NATIONAL CSS INC	6- 14	11 1/2	+ 1/4	+2.2
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	9- 17	12	+1	+9.0
N	PLANNING RESEARCH	2- 6	3 9/8	- 1/8	-3.3
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 9	2 9/8	0	0.0
O	REYNOLDS & REYNOLD	13- 24	13 1/2	+1	+8.0
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	- 1/4	-20.0
O	TYMSHARE INC	7- 21	17 1/8	+ 7/8	+5.3
A	UPS SYSTEMS	2- 4	3	0	0.0
N	WYLY CORP	2- 4	3 3/8	+ 1/4	+8.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	7 9/8	+ 1/4	+3.3
O	ADVANCED MEMORY SYS	1- 7	5 1/4	0	0.0
N	AMPEX CORP	3- 7	5 3/4	+ 3/8	+6.9
O	ANDERSON JACOBSON	1- 3	2	+ 1/8	+6.6
O	BEEHIVE MEDICAL ELEC	1- 5	3 3/8	- 1/8	-3.5
A	BOLT,BERANEK & NEW	9- 13	9 1/4	0	0.0
N	BUNKER-RAMO	4- 8	5	+ 3/8	+8.1
A	CALCOMP	4- 7	3 3/4	+ 1/8	+3.4
O	CAMBRIDGE MEMORIES	2- 5	2 7/8	+ 1/2	+21.0
N	CENTRONICS DATA COMP	7- 29	17 3/4	+2 3/4	+18.3
O	CODEX CORP	15- 38	34 1/2	+4 1/2	+15.0
O	COGNITRONICS	1- 2	3/4	+ 1/8	+20.0
O	COMPUTER COMMUN.	1- 2	3/4	0	0.0
O	COMPUTER CONSOLES	3- 7	4 1/4	0	0.0
A	COMPUTER EQUIPMENT	1- 2	1 1/2	- 1/8	-7.6
O	COMPUTER MACHINERY	1- 2	1 1/8	0	0.0
O	COMPUTER TRANSCEIVER	1- 2	1/2	- 1/4	-33.3
O	CONTEN	2- 5	3	+ 1/8	+4.3
N	CONRAC CORP	12- 23	21	+3	+16.6
O	DATA ACCESS SYSTEMS	1- 3	1 1/2	- 1/2	-29.0
O	DATA 100	9- 16	10 1/4	+1 9/8	+18.8
A	DATA PRODUCTS CORP	2- 6	4	+ 3/8	+10.3
O	DATA TECHNOLOGY	1- 3	1 1/2	- 1/4	-14.2
O	DATUM INC	1- 2	1	- 1/8	-11.1
O	DECISION DATA COMPUT	4- 7	4	+ 1/8	+3.2
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DIVAN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	1 1/2	0	0.0
O	FARPI-TER	1- 1	7/8	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	3- 6	3 7/8	+ 1/8	+3.3
N	HARRIS CORP	19- 29	23 7/8	+1 5/8	+7.3
A	INCOTERM CORP	3- 12	10 1/8	+ 3/4	+8.0
O	INFORER INC	2- 5	2 1/2	+ 1/4	+11.1
O	INFORMATION INTL INC	9- 14	13 1/8	+2 3/8	+22.2
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	MILGO ELECTRONICS	8- 24	14 3/4	+ 1/4	+1.7
N	MOHAWK DATA SCI	1- 5	3 3/8	+ 1/4	+8.0
O	OPTICAL SCANNING	1- 3	2 9/9	0	0.0
O	PENRIL CORP	2- 2	3/4	- 1/4	-25.0
O	PERTEC CORP	2- 5	4 3/8	0	0.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1/2	0	0.0
O	QUANTOR CORP	2- 6	4	- 1/2	-11.1
O	RECOGNITION EQUIP	2- 9	6 5/8	+ 3/4	+12.7
N	SANDERS ASSOCIATES	3- 11	8	+ 7/8	+12.2
O	SCAN DATA	1- 3	1 9/8	0	0.0
O	STORAGE TECHNOLOGY	6- 17	13 1/4	+1 1/4	+10.4
O	SYCOR INC	9- 19	13 1/2	+1	+8.0
O	T RAD INC	3- 6	6 1/4	0	0.0
O	TALLY CORP.	1- 5	3 1/8	+ 1/8	+4.1
O	TEC INC	1- 4	3	+ 1/4	+9.0
N	TEKTRONIX INC	18- 41	39 3/4	+2 1/8	+5.6
N	TELEX	1- 3	3	+ 7/8	+41.1
O	WANGCO INC	4- 9	9 1/4	+ 1/4	+9.0
O	WILTER INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 9	4 1/2	0	0.0
A	BARRY WRIGHT	5- 7	6 1/8	+ 1/8	+2.0
O	CYBERNATICS INC	3- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	32	0	0.0
O	DUPLEX PRODUCTS INC	12- 25	15 1/8	0	0.0
N	ENNIS BUS. FORMS	5- 7	4 7/8	0	0.0
O	GRAHAM MAGNETICS	9- 10	8 1/4	+ 1/2	+6.4
O	GRAPHIC CONTROLS	8- 21	12	+ 3/4	+6.6
N	3M COMPANY	43- 68	55 3/8	+5 3/4	+11.5
O	MOORE CORP LTD	39- 51	45 1/4	+2	+4.6
N	NASHUA CORP	11- 22	11 3/8	- 9/8	-3.1
O	STANDARD REGISTER	11- 20	15 3/4	+ 1/4	+1.6
O	TAB PRODUCTS CO	4- 8	5 3/4	- 1/4	-4.1
N	UARCO	17- 24	18 1/4	0	0.0
O	VANIER GRAPHICS CORP	4- 7	4 1/2	0	0.0
A	WABASH MAGNETICS	3- 5	4	+ 1/8	+2.2
N	WALLACE BUS FORMS	15- 25	16 7/8	+ 5/8	+3.8

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NEWSPAPER

CW Goes on the Road

IMS Problem Solving Not 'Bitpickers' Job

By Don Leavitt
Of the CW Staff

SAN FRANCISCO – The traditional approach to a performance problem involving anything as complex as IBM's IMS is to consider it a job for systems programmers with no user or application programmer/analyst involvement and little, if any, management effort.

In this view, "these people do not understand the situation, so it must be the 'bitpickers' that make the beast run better," IMS/VS evaluation manager Rich Maday of Michigan Blue Cross/Blue Shield told the recent Computer Measurement Group conference.

Coverage of the Computer Measurement Group meeting continues on Pages 13, 14 and 15.

But, he added a bit later, this traditional approach isn't really good enough any more.

In the traditional way of doing things, IMS tuning was reaction-oriented. "Nobody would tune a system that was running well. IMS would have to fall on its face" before much attention was paid to

(Continued on Page 5)

Privacy Laws Seen Forcing Defensive DP

By Ronald A. Frank
Of the CW Staff

QUEBEC CITY – As the scope of privacy legislation expands, users will have to begin practicing the defensive use of computers in much the same way that doctors guard against malpractice suits, attorney Ronald Winkler said at the recent Data Communications Symposium here.

Although legal challenges are still rare, this is bound to change as suits are filed in the area of privacy and data security. When this happens, the testimony of expert witnesses will become "very influential" in the courts because of the technical subject matter involved, Winkler said.

Data Symposium coverage continues on Pages 17 and 18.

These types of court challenges will hinge on whether the user took the necessary protective steps in advance to avoid compromising the computerized information, he said.

The courts will have to answer such questions as: Was the danger identified and known in advance? Was the solution identified and known in advance? What is

(Continued on Page 2)

But DP Work to Open Up

Automation to Hurt N.E. Job Mart

By Nancy French
Of the CW Staff

BOSTON – The number of jobs for clerks and unskilled workers will decline faster in New England than in the U.S. as a whole by 1980, largely because of increasing automation in the area, according to a report published by the Department of Labor here recently.

But while the report predicted a grim job market for clerical workers here, it forecasted a healthy growth in opportunities for computer programmers, analysts, operators and other DP specialists, since New England has one of the heaviest concentrations of computers in the nation.

The regional employment gain for all job categories will be held to a modest 12% compared with the national average of 22%, not only because of automation but also because of another factor – the withering industrial base brought on hy the high cost of doing business in the region, a spokesman said.

The total number of employed persons in New England is expected to increase from 4.8 million in 1970 to a projected 5.3 million in 1980, a gain of 568,000, according to Wendell D. Macdonald, of the Bureau of Labor Statistics' regional office, here.

During this same 10-year period, total U.S. employment is expected to increase by more than 17 million jobs, from 78.6 million to 95.8 million by 1980.

The largest gain of any major occupational group between 1970 and 1980 in New England is expected among the region's white-collar workers – especially in the professional and technical occupations, the report said.

Work "in the region's research firms and laboratories, the solving of social problems and the need to operate and maintain a growing number of computers will all require trained professional and technical workers," the report said.

By the end of 1980, the total number of clerical workers should reach more than 1 million, or 19% of the work force, making it the largest occupational group in the region as well as in the U.S. as a whole.

However, in both the region and the nation, the growth rate in this category will be slower in the latter half of the decade than during the first five years.

"Many clerical occupations will continue to be eliminated by the use of computers as they assume the routine and repetitive operations formerly done man-

(Continued on Page 2)

Appeals Court to Hear IBM Writ Protesting Actions of Edelstein

By Edith Holmes
Of the CW Staff

NEW YORK – IBM's request that the Second Circuit Court of Appeals review decisions and actions taken by the federal district court judge hearing the government's antitrust suit against the coporation [CW, Oct. 15] will be considered in a hearing scheduled for Oct. 22 here.

Consisting of a 25-page brief and lengthy appendices, the writ of mandamus filed by IBM with the court will remain sealed at the request of the Department of Justice until the hearing [CW, Oct. 15].

The writ used extremely strong language in describing the actions of Judge David N. Edelstein in the courtroom.

Written by Paul Dodyk of IBM's outside law firm, Cravath, Swaine and Moore, it called those actions not only "arbitrary and unlawful," but also "outrageous."

Edelstein's rulings have been "unauthorized, unprecedented and highly disruptive" in the course of the trial, the writ said.

In a cover letter, lead IBM attorney Thomas D. Barr claimed the orders of the judge have inflicted "irreparable injury upon our capacity to present a defense."

The use of a writ of mandamus is highly unusual, since it basically asks the appeals court to order Edelstein to obey the law as it is written and to instruct him on the bounds of his discretion under the law.

In addition, the extraordinary writ asks the court of appeals to discipline Edelstein, the sole arbiter in U.S. vs. IBM, for what IBM counsel termed "misconduct" in issuing orders which attorneys for the

(Continued on Page 3)

ACM Membership Tops 30,000; Psychological Factors Credited

By Catherine Arnst
Of the CW Staff

CAMBRIDGE, Mass. – The membership of the Association for Computing Machinery (ACM) has topped 30,000, "which I believe makes it the first society servicing the information-processing community to reach that number," according to Jean Sammet, president of the organization.

This is in marked contrast to June, 1974, when membership figures were reported holding steady at approximately 28,000 in the face of a 20% growth rate in the industry [CW, Nov. 13].

"This membership growth occurred without any particular promotions and gimmicks such as contests," Sammet noted. She attributed the increase to several psychological factors and a few practical ones.

"There is a significant improvement in our financial condition," she said, explaining ACM had a surplus in its budget for 1975. This helped because "nobody wants to join an organization which is clearly in financial difficulty."

In addition, "there has been improved handling of questions, problems and complaints and more efficiency in doing things right the first time, such as address changes," she said.

"The opinion survey and secondarily the membership profile that comes with each member's renewal form have demonstrated concern by the leaders for membership opinion; the indication of clear-cut directions from the Long-Range Planning Committee [LRPC] have also helped," she said.

On the practical side, "the effect of being able to reinstate services we had cut

(Continued on Page 6)

Xerox, Honeywell Ink Upkeep Pact

By Nancy French
Of the CW Staff

MINNEAPOLIS – Xerox computer users throughout the U.S. and overseas may find their systems being serviced by Honeywell field engineers if the two companies consummate the deal outlined in a letter of agreement both signed last week.

Details of the transaction will be made public by Dec. 1, the firms said in a joint statement, and the arrangement will become effective Jan. 1.

Under the proposed agreement, Honeywell will "handle all contacts with Xerox computer customers and provide continuing marketing, sales and maintenance support to Xerox computer users."

Xerox will continue to operate its mainframe computer manufacturing facilities in El Segundo, Calif., "into 1976" to produce equipment currently on order and spare parts.

Honeywell sales personnel will handle installations of equipment on order as well as sell or lease any equipment returned from lease customers for an indefinite period, a Xerox source said.

Xerox will continue hardware and software engineering through 1976; after that, this activity will also be taken over by Honeywell, the statement said.

Honeywell anticipates employing "a substantial" proportion of the Xerox marketing, maintenance and development personnel in both North America and overseas, the statement added.

All maintenance revenue is expected to be retained by Honeywell. However, the two will "share," in some fashion still to be determined, revenues from leases and installment sales of Xerox computers and from any future Honeywell sales of Xerox com-

(Continued on Page 4)

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By 1980, Labor Says

Automation to Hit New England Workers

(Continued from Page 1)

ually by payroll, accounting, inventory and billing clerks," the report said.

"On the other hand, the wide use of electronic data processing requires a greater number of operators and related workers to prepare material for the computer," the report noted.

Estimates provided by Massachusetts, where more than half the region's work force is employed, indicated industries within this state that employed 11,885 computer specialists in 1970 will be employing 15,085 by 1980, for an increase of 26.9%.

Programmers, who accounted for 7,802 members of Massachusetts' work force in 1970, will account for 9,502 members of it by 1980, an expansion of 21.7%; and systems analysts, who held 3,477 jobs in the state in 1970, will increase in number to 4,777 by 1980, for a 37% jump.

Computer and peripherals equipment operators, who numbered 4,738 in 1970 will claim 6,738 jobs in 1980, representing a 44% gain.

Keypunch operators, who accounted for 12,243 jobs in 1970, in the face of advances in data entry techniques, will hold 13,343 jobs in the state in 1980, a gain of only 8.9%.

Connecticut Work Force

In Connecticut, where roughly 25% of this region's work force is employed, computer specialists will hold 6,950 jobs by 1980, as compared with 5,990 jobs in 1970. The gain for this category is 16%.

Computer programmers and systems analysts, which are grouped into one category by this state's labor statisticians, will hold 6,480 jobs in 1980, an increase of 15.9% over the 5,590 jobs on the books in 1970.

The keypunch operator category, which accounted for 6,140 jobs in 1970, will decline to 5,350 by 1980, for a loss of 12.9%.

The computer and peripherals equipment operators category, which accounted for 2,700 Connecticut jobs in 1970, will shoot up 40.4% by 1980 to 3,790, the report said.

Little Change in Blue Collar Jobs

The total number of blue-collar workers in New England is expected to increase by a slight 2% between 1970 and 1980, according to the report.

This, however, will not come about as a result of widespread computerized process control in the region's manufacturing plants, but rather because of the decline in manufacturing in the region.

Blue-collar jobs in this region will decline from 36% of all occupations in 1970 to 33% by 1980, compared with the national level where such employment is expected to grow 14%.

Service industry workers appear to be the only people expected to come through the decade unaffected by automation, the report indicated.

Although the number of service workers should increase by almost 3 million in the U.S. by 1980, growing 31 percentage points, regional growth will be somewhat more modest, where a 12% gain was forecasted.

"By its very nature, the service industry should not experience any marked decline in employment due to future technological changes."

Practice of Defensive DP Seen

(Continued from Page 1)

the installation designed to do? What are the cost factors involved? What are the industrywide practices?

Standards are now being formulated to apply to the Privacy Act of 1974; users must make sure they can live with these standards because it seems virtually certain they will be carried over to apply to the private sector, Winkler warned.

The Privacy Act applies only to federal agencies, but the Koch-Goldwater bill now pending in Congress would extend these principles to private industry. As long as this bill retains its current number of H.R. 1984 and deals with individual privacy, it will be passed as a politically expedient measure, Winkler told attendees of the symposium sponsored by the Institute of Electrical and Electronic Engineers and the Association for Computing Machinery.

In the data security area, the potential liability of a user may hinge substantially on the existence of a known danger and a known solution, Winkler said.

The best defense of the computer communications professional is to be aware of the most significant reports on data security and to be able to justify any deviations from "generally recommended or available security measures," he said.

The party who asserts technological infeasibility will bear the burden of proving it, Winkler warned, adding that, in general, courts are "loath to become involved in questions involving complicated technological issues."

Laws to Alter Equipment Choices

QUEBEC CITY – New legislation covering privacy and security will alter the way in which users select DP equipment and perform other functions, according to Ronald Winkler, a Washington, D.C., attorney.

As one of the first indications of how these requirements will be administered, Winkler pointed to a recent decision handed down by the U.S. Comptroller General which concerned the awarding of a facilities management contract for DP services by the Federal Energy Administration (FEA).

The FEA had awarded the contract to a vendor operating with an IBM 370/168 under OS/MVT. The FEA request for proposals (RFP) had clearly spelled out that "the system shall provide for protection of user programs, the operating system and the areas in which their code resides from read or write access by other users."

After elaborating on the importance of the protective read and write requirements, the decision said "the hardware/operating system configuration proposed . . . did not (and could not) meet the mandatory RFP security requirements set out above, in that the OS/MVT operating system on the IBM 370/168 CPU cannot protect against read access to the main memory of the CPU.

"This 'weakness' in the OS/MVT IBM 370/168 CPU configuration is well recognized in the computer industry," the decision said. "In view of FEA's clearly stated need for security and protection of sensitive information, we find FEA's relaxation of this mandatory requirement . . . to be neither prudent nor proper."

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IBM Pressing for Abandonment of Antitrust 'Gag Rule'

By a CW Staff Writer

NEW YORK – IBM last week asked the judge hearing the government's antitrust suit against it to lift an order that bars the parties from communicating with the press and public – an order which IBM has been reprimanded for violating in the past.

In a motion to Judge David N. Edelstein, the IBM attorneys said the so-called "gag rule," Pretrial Order 4, should now be abandoned, even though they had originally requested it.

The motion was based on very recent discovery and document production "that we have had both from the Department of Justice and this organization which calls itself the Computer Industry Association (CIA)," according to lead IBM attorney Thomas D. Barr.

Speaking to Edelstein in a "robing room" conference held last Wednesday, Barr said the court would find "a substantial number of documents relating to the relationship between the [CIA] and the plaintiff, the Department of Justice.

"There is no doubt," Barr continued, "that under the terms of Pretrial Order 4, which your honor makes applicable to a person in any way involved in the case or a consultant employed by either side, that the so-called CIA has been employed in that capacity by the attorneys for the Department of Justice."

In the past, however, IBM has been reprimanded by the judge for what he felt might be violations of the order.

In the first instance he had Vincent Learson, then IBM chairman, brought into the courtroom for a dressing-down on remarks Learson made to stockholders indicating there was nothing to worry about in the government's case against the firm since IBM would win.

The second case came on the opening day of the trial when Frank T. Cary, now IBM chairman, made some remarks about the case to reporters outside of the courtroom [CW, July 2]. The IBM lawyers were ordered to make sure Cary made no further statements to the press.

Finally, there has been some criticism of IBM in regard to the order since the firm widely distributed reprints from an article from its internal magazine, *Think*, about the case.

The article, which explained the IBM defense in detail and its position in the trial while glossing over the charges against it, was circulated by the firm's public relations department to members of the press in what appeared to some to be a blatant violation of the order.

With regard to the CIA, lead government attorney Raymond M. Carlson said he was not aware that any of the rigorous procedures established by the Department of Justice for hiring consultants had been followed in the case of the CIA.

"We certainly have asked the Computer Industry Association and many, many other persons in the industry for information," he added.

Appeals Court to Hear IBM Writ

(Continued from Page 1)

defense argue prejudice the case against their client.

Lest Edelstein and the government take the writ filed with the appeals court too lightly, IBM sent one of its attorneys, Paul Saunders of Cravath, Swaine and Moore, to Dayton, Ohio, on the day the action was filed with the appellate court to interview two of the government's witnesses.

Saunders conducted a joint interview with Robert S. Oelman, NCR chairman until 1974, and John J. Hangen, senior vice-president of corporate affairs for NCR. Government attorneys were not informed of the interview and so were not present.

A transcript of the proceeding was taken, however, in compliance with Edelstein's order, which was originally made at a pretrial conference May 12.

Both men were scheduled to appear in court and did take the stand last week. But before Oelman, who was next on the government witness list, could climb into the witness box, Grant Moy, the Justice Department attorney assigned to conduct the direct examination of these witnesses, rose and explained to the court that a transcript of the interview taken in Dayton had not been made available to him or his colleagues.

Moy said he has been told by IBM counsel "not to expect to receive it" because of the writ pending with the appeals court. IBM counsel indicated it would not release the transcript to the government or the witnesses until the matters it brought before the appellate court are resolved, Moy added.

Edelstein noted IBM's action raised the question of whether his order would remain in effect until the appeals court rules otherwise. He suggested lead IBM attorney Thomas D. Barr could be placing himself in contempt of court by ignoring the order.

'Robing Room' Conference

Following the completion of Oelman's testimony, the court retired to the "robing room" where Edelstein heard both parties concerning the availability of the transcript from IBM's interview of the government witnesses from NCR.

Barr noted he did not wish to fail to comply with Edelstein's order if he could avoid it. "At the same time, I wish to preserve in its full aspect the substance of the matter that I have tried to place before the court of appeals," he added.

". . . If I take a literal – and I emphasize 'literal' – reading of the court's order . . . [then] the transcript is available in the sense that it could be turned over at some time to the court and to counsel," Barr said.

The court order places "no time factor on it," he went on. "I would concede this is a fairly slender reed, but under the circumstances I think, your honor, it is an adequate one to stand on for the present."

But, Edelstein said to Barr, "it is not only an order . . . it is an order in which you participated, it is an order in which you added a proviso and it is an order to which you agreed. It is an order to which you raised no objection."

Barr finally agreed to deliver a copy of the interview transcript to the judge and has since presented a copy to the government and the witnesses as well.

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Mainframer Turned Down Offer

Telefile Campaigning to Buy Xerox Base From Users

By Nancy French
Of the CW Staff

IRVINE, Calif. – Spurned in its offer to buy Xerox Corp.'s Data Systems Division's manufacturing rights, leased computer base and maintenance contracts, Telefile Computer Products, Inc. has launched a campaign to buy the Xerox lease base and all maintenance contracts directly from the users.

"They're the ones who have the most to gain," Sam V. Edens, Telefile president, said here last week.

Describing his talks with Xerox Data System's management as having produced "nothing but frustration and dismay," Edens said "I seriously question Xerox's intent with regard to supporting their users as they have stated in the press."

Telefile has offered to pay users "top dollar" or accept for trade-in all Xerox CPUs currently on lease and being maintained by Xerox, the firm said.

When the Xerox lease expires, Telefile said it will return the user's core memory and peripherals to Xerox and replace them with new Telefile core memory and peripherals.

Telefile will pay "up to 55% of the original purchase price for Xerox Sigma 3 and Sigma 5 CPUs, up to 66% for Sigma 6 CPUs, up to 77% for Sigma 7s and up to 88% for Sigma 8s and 9s," Edens said.

Telefile also will pay up to 60% for Xerox 530s and 73% for Xerox 550s and 560s, he added.

The company will also consider trade-ins and lease-backs of purchased CPUs and those currently on installment purchase contracts, he added.

Telefile already has picked up at least one new Sigma 6 user – the University of Wisconsin at Green Bay, Edens said.

Telefile will guarantee spare parts and total systems maintenance for at least 15 years for Xerox computer systems configured with all Telefile main memory and peripherals, he said.

Telefile offers or soon will offer maintenance in 20 cities, including Atlanta; Birmingham, Ala.; Boston; Chicago; Columbus, Mo.; Dallas; Detroit; Green Bay; Houston; Indianapolis; Irvine, Calif.; Memphis, Tenn.; New York; Philadelphia; Richmond, Va.; Rochester, N.Y.; St. Louis; San Jose, Calif.; Tulsa, Okla.; and Washington, D.C.

The offer is good until Dec. 31 "but actual transfer of title can become effective when the individual leases expire," Edens said.

University First to Make Sigma Lease-Back Deal

GREEN BAY, Wis. – The University of Wisconsin here is the first Xerox computer user to turn over its system to Telefile Computer Products, Inc., which replaced all Xerox peripherals and main memory with Telefile gear and leased the system back at nearly the same monthly cost.

For an additional expenditure of 1 cent on the rental dollar, the university's Sigma 6 system has 50% more core, twice as many communications ports and an additional I/O processor, according to Edward Glaaser, director of computer service.

During the course of the seven-year combination lease/installment purchase plan, the computer system will be maintained by Telefile.

The deal was initiated before rather than after Xerox announced it was leaving the computer mainframe business, but Glaaser's arrangement with Telefile has drawn "all kinds of compliments from higher-ups for my extreme foresight, which of course I didn't have," he remarked.

According to Glaaser, the Sigma 6 system, installed in March, 1973 to replace an IBM 1130, became overloaded within a year.

"In mid-1974 it was apparent our response time could be improved with more core," he said. "We also needed additional disk storage and another I/O processor.

"But in the present-day public university world, money is very hard to come by," he said, "and my efforts to obtain funds for these changes through normal budget channels were unsuccessful."

In late 1974, Telefile President Sam V. Edens offered to lease Glaaser the equipment he needed, but Glaaser couldn't afford to buy or even lease anything extra.

"Half joking, I suggested that Telefile pay off my Xerox lease and then lease the same system, upgraded with Telefile gear, back to me for the same price I was paying," he said.

Much to Glaaser's surprise, Edens agreed to take him up on the idea a few months later, he said.

Then the Xerox decision to leave the mainframe business was announced, and it was an even better idea, he said.

"We had some difficulty with the state bureaucracy which had never heard of refinancing a computer," he said, "but we worked our way through that and, lo and behold, we have a seven-year contract at only $106/mo more than the system I was leasing from Xerox."

After the first two years, that additional amount will drop to $6/mo more, he explained.

System More Powerful

"The system we have now is faster and considerably more powerful and flexible than the previous version," Glaaser said. "We had absolutely no reprogramming to do and we are now assured of being able to get good maintenance and system enhancements in the years to come."

The updated system contains only the basic Xerox Sigma 6 CPU. Telefile is providing all 96K words of core memory plus such peripheral devices as four 49M-byte dual-density disk drives, a 400 card/min card reader, a 600 line/min buffered line printer and associated controllers and communications gear.

The system is used for both administrative and academic purposes at the 4,000-student, five-year-old university, he said.

"We are using the Extended Data Management System to maintain a full student data base, a personnel data base and a library acquisition and cataloging system similar to the well-known Ohio College Library System," he explained.

"Our library has one terminal on-line to access that data base," he said.

"While all this is going on, we run the normal mix of batch programs consisting of student and faculty research packages as well as administrative packages," he said.

Xerox, Honeywell Ink Pact for Maintenance

(Continued from Page 1)

puter equipment.

As it now stands, Xerox will continue to own its computer assets and Honeywell will make no cash payments to Xerox other than for shared revenue and for Xerox equipment parts needed for maintenance.

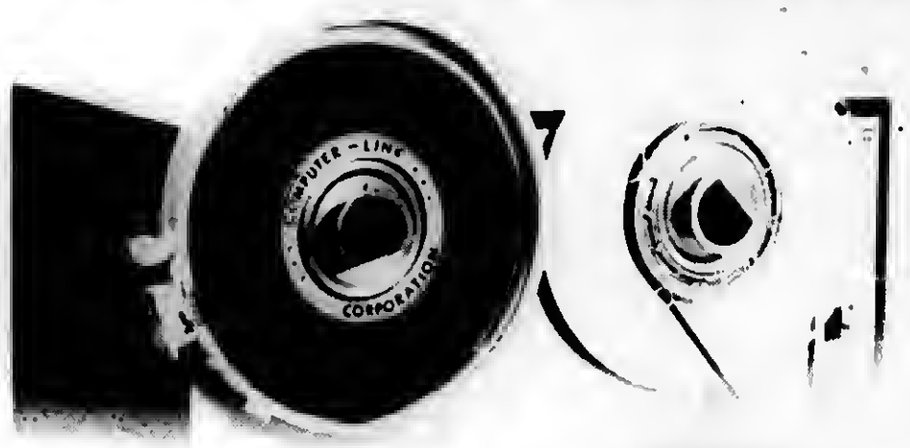
Honeywell said the proposed transaction will increase its revenues and earnings and, at the same time, provide an opportunity to add to its customer base and to offer needed service to a broad segment of computer users.

Xerox said the proposed arrangement will fulfill its obligation to its computer customers for service and support and allow for "an orderly transition of that business to an established company in the industry."

A Xerox spokesman said the transaction will not affect the $84.4 million after-tax write-off Xerox took in the quarter ended June 30 for expenses connected with its withdrawal from computer mainframe operations.

The proposed arrangement does not include manufacture and sale of disk drives, serial printers and terminals produced by Diablo Systems, Inc., a Xerox subsidiary, or Xerox's high-speed non-impact xerographic printers for DP systems. The operations of Xerox Computer Services are also not included in the agreement, the statement said.

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IMS Problem Solving No Longer Job for 'Bitpickers'

(Continued from Page 1)

it, Maday said.

Poor IMS performance "always showed itself as poor response time," he said, and as long as response time was good, "any other problem with IMS was chalked up as a necessary expense for having a state-of-the-art system."

When response time was bad, he went on, systems programmers dug into all the notes and reports they had collected, sorted them in their idea of return-on-investment possibilities and implemented them. When they struck gold, "the pressure was off and they waited for the next response-time crisis."

Gold Miner Technique

"My data base administrator friends in Detroit affectionately call this the 'gold miner' technique . . . Nobody asks the successful gold miner how many empty shovels he had. They are only concerned with the number of bags of gold he brought back," Maday quipped.

As "the supposed manager of these efforts," however, he began to ask himself if there wasn't a better way to control IMS tuning. And yet "the gold miners were apparently successful – why rock the boat?" he asked, mixing his metaphors.

Reviewing the growth of IMS usage at his installation over several distinct time frames, he noted tuning often seemed to trigger even heavier use of the system and eventually "the world started to move faster than the gold miners."

Growth demanded organization of the tuning because, although user satisfaction was high, costs "were no longer unnoticed."

Finally, he said, "the gold miners have disappeared" and management planning and control will continue to be mandatory. Now, instead of "not bothering" management as in the old days, "it is our intention that there be real management influence in every aspect of IMS."

Six-Step Strategy

Maday's IMS performance improvement strategy can be described in six steps, he explained. The first is to develop a basic understanding of the system and the environment in which it operates.

"We can look at hardware and software until we're blue in the face, but the basic component of everything we do with IMS – or do to it – are the people.

"The real needs of your users or customers have to be understood. Filling human needs is the reason for all DP endeavors," he said, adding "IMS problems are community problems" and "it is mandatory that your technical staff be aware many external changes needed to improve performance will probably be accomplished through traditional political activity."

Establishing a data base/data communications administration function with full executive support will tend to reduce if not eliminate this political activity, he ventured, so that improvements can be based on facts.

But the facts had better include a solid understanding of how IMS works, he cautioned, so improvements can come through use of options already available rather than tinkering with IBM's code.

Step two of Maday's plan is to gain a detailed analysis of the complete IMS environment. Find out if any users have established any performance objectives concerning IMS, he urged, and find out especially if there are potential conflicts between any of these perceived objectives.

Utilize whatever measurements are already being taken of the system performance, he went on, but "don't make a big deal about using someone else's data. You'd be surprised at how protective some groups will be with 'their' data."

Anyone with a substantial IMS involvement should be associated with a major IBM/IMS user group, he volunteered. "Consider user groups a loop process – you give, you take, you give, etc."

Define Guesses

Under step three of the formalized tuning effort, specific theories or guesses about performance problems should be defined. These definitions "must be meaty" and not vague, he said, commenting this is the step most often skipped in any performance improvement effort.

"Look into your 'trick bag' to see if you have a way of measuring any of the specific theories," he went on. "If the right tool isn't available, go on to another, more easily measured theory."

Step four consists of time to attempt to analyze the real cost/benefit effectiveness of any modification made in an attempt to improve performance.

"These are not always very large-scale decisions, but all should be treated with the same vigor," Maday noted. The widest possible consideration of possible risks should be part of this cost/benefit review, he said.

Step five is the time the systems programmer gets the go-ahead and when he should spend even more time and collect more data before making any change.

Management should back the programmer in this final consideration cycle with, if it seems advisable, implicit approval to do something different than originally planned.

Step six is a final evaluation of what has been done and leads back to consideration of what might usefully be done next to improve the performance even more.

In any case, "document your successes and your failures," Maday recommended, since review of what went right or wrong "may encourage good new directions and halt useless efforts."

Correction

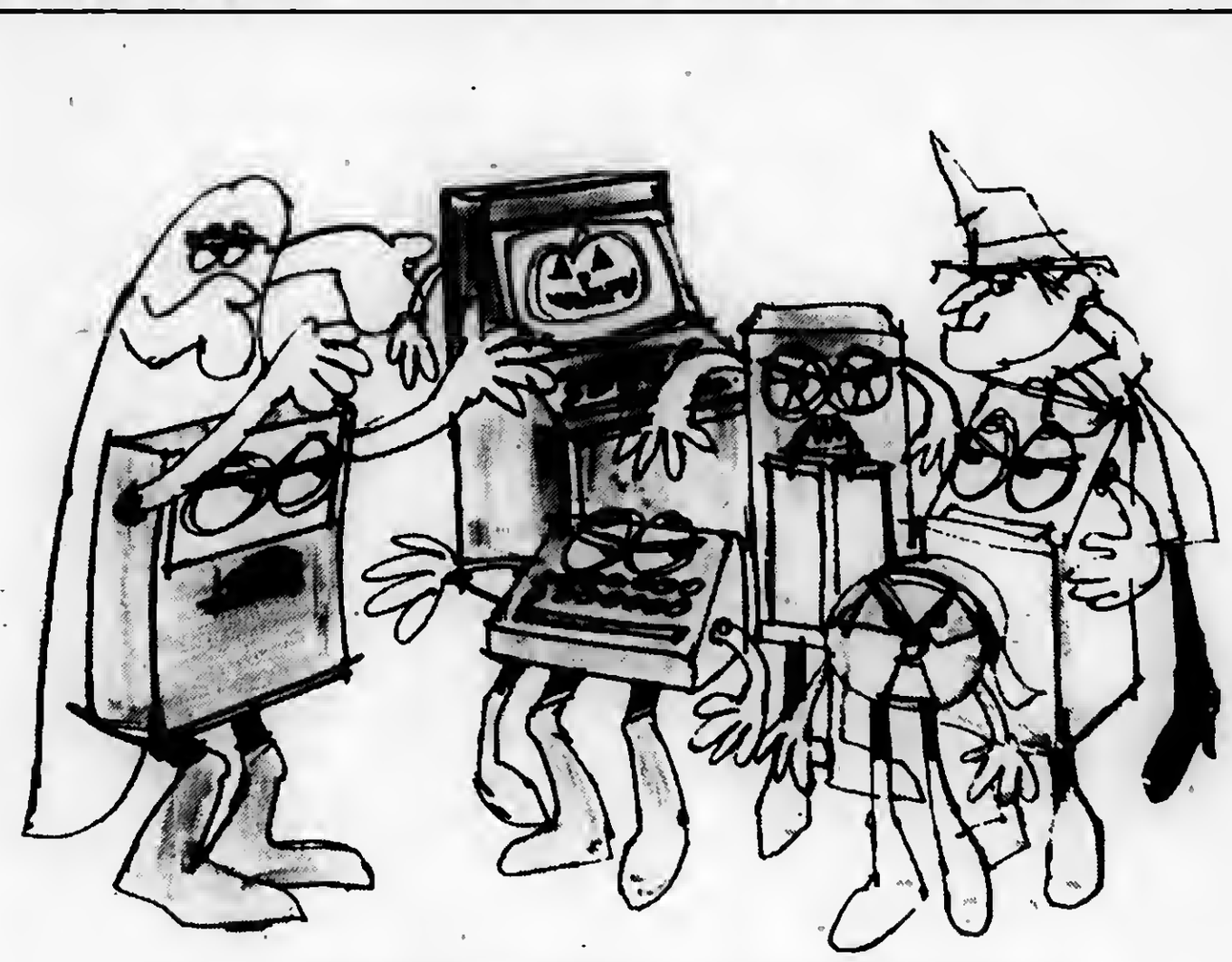
The sponsor of the recent meeting in San Francisco at which two University of Michigan representatives described their techniques for evaluating the Amdahl 470V/6 [CW, Oct. 15] was the Computer Measurement Group.

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Psychological Factors Aid Rise in ACM Membership

(Continued from Page 1)

significantly, such as the number of pages in the journals and lecturers to chapters, support at headquarters and a new journal" have also helped to attract new members, she said.

"There is a negative side," Sammet said. "We have not grown anywhere near as fast as the industry is growing and student membership still has not grown."

Student membership is a major concern because "students are very important for the long-range health and growth" of a society, she said.

"We don't understand why more students don't join," she puzzled. "It is probably the biggest bargain they will ever receive." Students pay $11 in yearly dues while regular members pay $35.

Referring to ACM's membership not keeping up with the industry's growth rate, "I wouldn't expect ACM to grow as fast as the industry," Sammet said. But, she still feels the organization should be increasing its rolls faster than it is.

A large part of the growth in the industry is in the area of applications programming and ACM is not doing many things in that area, she said. This is a partial explanation of why ACM has not grown as fast as it possibly could, she added.

Last year's report of the LRPC, of which Sammet was chairwoman, addressed that issue when it stated that "ACM should be doing more for practitioners of DP" [CW, Nov. 20].

When asked whether ACM had done more for practitioners since the report was made, Sammet answered "not really." This is partially the fault of those who say ACM should be doing more, she complained.

"The people who say we should publish more articles for practitioners haven't written anything for us to publish," she said.

"The academic and research people have a tradition of publishing and their advancement depends on publishing," which isn't so of practitioners, she noted.

"In some cases, it could be to a company's disadvantage to publish some of its discoveries" for fear of helping out its competitors, she added.

One of ACM's strengths, however, is that it can create a dialogue between researchers and practitioners and can get researchers' results to practitioners, she said.

The LRPC also proposed starting a publication devoted strictly to business DPers. As an alternative, ACM has been actively working on a revision of its current research journal, *Communications of the ACM*, making it one "that contains ACM news and information but also contains technical material that is more interesting to people," Sammet said.

For 1976, one of ACM's projects will be a self-assessment program for members, which Sammet described as "one of the most exciting concepts that I have come across in many years."

The first tests will be published in *Communications* in mid-76 for a trial run and, if they are successful, the program could "in the very long run be one of the most important activities that ACM has ever undertaken."

The basic concept of self-assessment is that a test covering knowledge in a particular technical area is made available to an individual who wants to find out how much he knows about a particular topic, both in an absolute sense and in comparison with his peers.

The purpose of the self-assessment tests is "self-education, not grading or certification," Sammet emphasized. "We will still need certification," she said, but stated she does not support the concept of licensing.

However, ACM should be involved as much as it can be in the implementation of any legislation dealing with licensing, she said.

ACM is forbidden by its tax status to lobby, she said, but it is required as an educational, technical and scientific society "to operate in the public good.

"ACM does a number of things for the public," she said, mentioning it has a "responsibility to publish material which is of benefit to society and advance the state of the art. It also serves an educational purpose, such as holding conferences of all kinds."

CMU Pair Share Turing Award

MINNEAPOLIS – Two professors at Carnegie-Mellon University (CMU) have been named corecipients of the 1975 A.M. Turing Award by the Association for Computing Machinery (ACM) for their technical contributions to the advancement of the computer arts and sciences.

Allen Newell and Herbert A. Simon were cited for their joint scientific efforts extending over 20 years which have resulted in contributions to artificial intelligence, the psychology of human cognition and list processing, a widely used data structure in computer science.

The Turing Award, which carries an honorarium of $1,000, was given at the opening session of the 1975 ACM Annual Conference here this week.

In psychology, an ACM statement noted, Newell and Simon were the principal instigators of the idea that human cognition can be described in terms of a symbol system. They have been able to simulate the working of human short-term memory and human problem solving in tasks such as playing chess.

Newell has been a university professor at CMU, where he received his Ph.D., since 1961. Simon is the R.K. Mellon Professor of computer science and psychology at CMU.

The award was established in 1966 in honor of A.M. Turing, whose paper, "On the Computable Numbers," appeared in 1936. He gave his name to the concept of nontrivial automata, the Turing Machine, and pioneered much of the theory that shaped programming and computer design.

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Two Years After Firm Left Mart

Users Still Don't Regret Choice of Memorex Machines

By Patrick Ward
Of the CW Staff

Two years after Memorex Corp. left the mainframe business, two users who still run MRX/50 shops said they don't regret their choice of machines.

For instance, the MRX/50 at Danneman Fabrics in Dover, Del., does jobs in three minutes that took 90 minutes on an IBM System/3 Model 10, Petrus Koot, DP manager, said.

Thc 64K MRX/50 performs like a 360/50 or 370/145 and has not caused him a single hardware problem in two years, Koot said.

The MRX/50 at Computer Utilities of Wisconsin is an "infinitely bctter machine" than the IBM 360/20 it replaced, according to President Bob Bartfeld. The Memorex machine's speed and throughput "just don't compare" with what the 360 could muster, he said.

Memorex began deliveries of its MRX/40 and MRX/50 CPUs in early 1973. The machines had been aimed at the 360/20 replacement market and offered 360/20 emulation, a DOS-like operating system and compatibility with tBM peripherals.

However, the MRX/40 and 50 had the appeal of advanced technology such as multiprocessor architecture and MOS memory, which led to 800-nsec cycte times on the MRX/50.

By mid-1973, Memorex decided it could not continue to take the losses from the mainframe venture and went back to concentrating on the peripherals business.

tt promised hardware support to purchases and to lessors until the end of their lease periods. No other vendor came in to pick up the customer base.

Takes a Gambte

Danneman Fabrics had expressed interest in renting an MRX/50 just before the Memorex mainframe venture went under, Koot recalted.

After the announcement, Memorex offered to sell a 64K MRX/50 with consote, t,200 line/min printcr, card rcadcr/punch, card reader and four 29M-byte disks for $65,000, he said. Memorex promised hardware support as long as it had a field service organization.

"We had to do soul-searching in that we realized we wouldn't get any software support and that the hardware support would be different than anticipated. But we still felt, for the price we were paying . . . and the capabilities of the system, it was worthwhile taking the gamble," Koot said.

That MRX/50 has since more than paid for itsetf, he said.

Conversion from the shop's System/3 to the MRX/50 went smoothly, he added.

"Memorex really missed thc boat bccause they went after the Model 20 market when they should have gone after the System/3 market," he said.

Memorex had apparently felt conversion from the System/3 would be too difficutt, but, in Danneman's case, a Memorex engineer wrote a small microprogram that easily converted the System/3 files to the MRX/50's disk organization.

Once the shop switched ovcr, it found "a world of difference."

The 800-nsec access times on the MRX/50 compared with a 2.5M-sec figure on the System/3, he said, and this showed up in throughput.

"I had written inventory programs in ANS Subset 3 Cobol that ran about 90 minutes on the System/3," Koot said. The same programs run on the MRX/50 in under three minutes, he said.

Similarly, RPG runs that took six hours on the System/3 take less than 40 minutes in Cobol on the Memorex.

The only fault with the MRX/50 software is the RPG compiler, "which is very flaky, to say the teast," Koot said. "The Cobol compiler is a low lcvcl D but it has some enhancements IBM doesn't have undcr DOS today," Koot said.

Danneman is a 13-store retait outlet, and the DP department handles batch inventory and accounting applications. It also does outside service for smatl companies around Dover.

Koot plans to go to teleprocessing at the end of the year. "There is a teleprocessing monitor available, but we will probably write our own," he said.

More Careful

Working without vendor software support has made the Danneman staff "more careful when they do make patches," Koot said. "They know they can't go back to anybody in Memorex and say, 'OK boys, bail me out.' "

While Koot is happy with his $t,420/mo maintenance service, he bought a second MRX/50 system for backup protection.

"If the first one did break down, the ncarest backup would be in Baltimore, a 2-1/2 hour drive away," he said.

He is considering buying an MRX/40 system for spare parts. Used systems are selling for about $3,500 now, he said.

"We hope to get 10 to t5 years" out of the MRX/50s, Koot said. When the shop does finally convert to another mainframe, he plans to get around the problem of incompatible disk formats by bringing in tape drives and doing a disk-to-tape dump. The standard-format tape files would then make conversion easier, he said.

Like Danneman Fabrics, Computer Utilities of Wisconsin bought an MRX/50 shortly after Memorex left the mainframe business.

"We tooked into it, liked the features and decided to go ahead anyway," said Bartfeld of the Milwaukee-based service bureau.

Conversion was not particularly difficult. "We were under no particular time pressure" and could run the 360/20 programs in emulation mode, he said.

In coping with the tack of vendor software support, "We just made do with what we had on the system, Bartfetd said. "We have not run into a problem which we coutd not sotve."

The MRX/50 is the only mainframe at the service bureau whose jobs run the gamut of business DP, Bartfetd noted.

Ex-Customers More Cautious

Former Memorex Corp. computer users share a liking for third-party IBM machines and a cautious attitude toward brand-new hardware.

Interviews with three ex-Memorex users who were included in a survey [CW, Aug. t, t973] when their vendor exited the mainframe scene in the summer of t973 led to these conctusions.

The users did not seem to harbor any bitterness toward Memorex, perhaps because they were all renting or testing the machines at the time of the company's announcement.

"I use their products whenever I can," according to Paul Bultmeyer, vice-president of Educationat Reading Service, Inc. (ERS) in Mahwah, N.J. The shop replaced an IBM 360/20 with an MRX/40 in early t973 and then converted back to the 360/30.

Memorex would not collect rent on their machine while it was running parallel with another, Bultmeyer recalled, so the MRX/40 served as a bridge between the shop's 360/20 and 360/30.

If ERS had gone directly from the 360/20 to the 360/30, it woutd have had to pay overlapping rent charges, Buttmeyer observed.

ERS had trouble with some of the MRX/40's peripherals and the software was "not what it would have been if Memorex had stayed in business," he said.

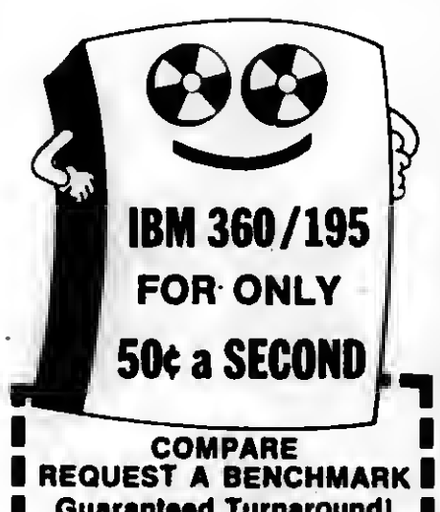
Bugs in the Compiler

Software bugs, particutarty in the RPG compiter, plagued Everlon Fabrics of Closter, N.J., during the time the company tested a Memorex machine. "We all felt the hardware was good, but we felt they didn't have the software ability IBM has," Milton Mayer, DP manager, said.

"I think I would have enjoyed" the Memorex CPU; "they had such a good operating system," said Tom Justice, the DP manager at Wheel Horse Products in South Bend, Ind. "It really had a few advantages."

In retrospect, though "I would certainly look at a company's financial outlook before making a major commitment to its products," he remarked.

Mayer echoed that view: "I would closely examine something new and maybe give it a little trial period out in the field."



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Toronto Boroughs Nix All Moves Toward Consolidation

By Catherine Arnst
Of the CW Staff

TORONTO – Fearful of losing their autonomy, the six boroughs of metropolitan Toronto have refused to consider any moves toward consolidation of computer operations.

The Metro Executive Committee last month turned down by a vote of 21 to 10 a proposal to conduct a study on the feasibility of merging the boroughs' computer operations – a move which, it was estimated, would have saved $2.5 million.

Albert Orsava, the director of Metro Toronto's computer operation and the person who proposed the merger and the study, said the boroughs "have a few legitimate reasons for opposing consolidation, but in this day and age they are not very professional ones."

"A lot of people were scared skinny that their autonomy would be taken away," Mayor Willis Blair of the borough of East York said. "We want to keep our ability to get things done when we want them done."

Orsava said the boroughs fear a lack of services if DP operations are merged. "It's difficult to convince them otherwise. I'm quite positive we could have overcome these problems, but I wasn't given a chance to convince them," he said.

Orsava feels the committee members are not well-educated in the area of computers: "People don't really understand computers," he said. "I think they even fear computers."

Blair agreed, saying "I would be surprised if 25% of the area politicians really understand computers, which is part of the problem."

Very Little Cooperation

Presently about 15 computers are operated by the boroughs and there is "very little if any cooperation between them," Orsava said.

Although all the boroughs must follow the same regulations and union rules when doing payrolls, for example, they all have separate payroll systems, he noted.

There would be some problems in conversion, Orsava admitted, particularly in the selection of a central computer. Currently two boroughs have purchased equipment, while the rest lease or partially lease.

There are three main vendors involved – IBM, Honeywell and Univac, he said.

Orsava had hoped to start consolidation efforts by establishing three subcenters – one for each vendor – which he thinks would have taken a year.

"We then would have gone to competitive bidding to choose one central computer," he said, estimating the move to one center would take another year.

The cost of the study on consolidation would have been $30,000. which could quickly be recouped in the savings generated by centralizing, he said.

The Canadian provincial government started in 1972 to consolidate 14 computer centers and is now down to four; "the plan is going almost on schedule and it has already saved much more than $2.5 million," Orsava noted.

Paul Cosgrove, mayor of the borough of Scarborough, was the only mayor in favor of consolidation and was disappointed that even the study was voted down.

The consolidation proposal "disturbed a few feathers," he said. "There will always be competition between the different levels of government and kingdoms to be protected."

His own borough has already adopted a proposal that calls for a study on the feasibility of voluntary consolidation of the various types of applications being run, such as payrolls and public utility billings.

While Cosgrove does not think the other communities will investigate such options at this time, he does believe "politicians will change in the future.

"The public is impatient with politicians and bureaucrats that won't cooperate in the areas where they can save the taxpayers money," he said.

'Red Herring'

The borough of Egobicoke is "vehemently opposed" to both the study and any plans of consolidation, according to Dean Patterson, executive assistant to that community's mayor.

"Consolidation is only a savings in theory, not in practice," Patterson said. Referring to the provincial government's efforts, he said that although costs decreased, "the service went completely down."

The issue of autonomy is only a "red herring," Patterson said. "Consolidation won't ever be economically feasible, as far as we're concerned," he said.

A large operation is always more expensive than a small shop, he added – "if it were possible to save money through centralization we would support it."

Newspaper Team Gets DP Assist In Probe of District Attorney

By Toni Wiseman
Of the CW Staff

BOSTON – Members of the *Boston Globe*'s investigative "Spotlight" team used a computer to assist it in its latest probe, this one into the performance of Norfolk County's district attorney.

The team found George C. Burke, who recently resigned from the district attorney post, prosecuted crimes in his county not only less successfully than other Massachusetts district attorneys, but also more expensively.

Using the newspaper's Texas Instruments Silent 735 and Computer Science Corp.'s SPSS statistical package, the *Globe* team analyzed information on crime charges, trial outcomes, bail, sentences, fines and pertinent dates for more than 2,000 cases.

The data was extracted from docket books and other court papers.

To compare Burke's performance with that of other district attorneys', the Spotlight team conducted similar survey work in other parts of the state, according to a report in the *Globe*.

Studies of equal depth were conducted for Middlesex and Plymouth counties, according to Spotlight team member Peter Cowen.

About this time, however, the team discovered that each Superior Court submits statistical information on its performance to the state Corrections Department.

"Those reports actually made any further research moot," Cowen said.

The samples culled in Norfolk, however, provided a more precise breakdown of offenses than Corrections' records could have provided. The team was able, for instance, to distinguish between sale and use offenses of drugs, he noted.

"The prosecution record in Norfolk County – disposing of cases, convicting defendents and sending criminals to jail – was markedly lower on the average than that of the other eight district attorneys," the *Globe* article stated.

The study revealed, for instance, that during Burke's eight years in office, only one gambler indicted in Norfolk County went to jail and three out of every four cases contested in Superior Court were lost.

Cowen praised the use of the computer in aiding the investigation, saying it is "the future trend in journalism."

Bank on Lab Animals Set

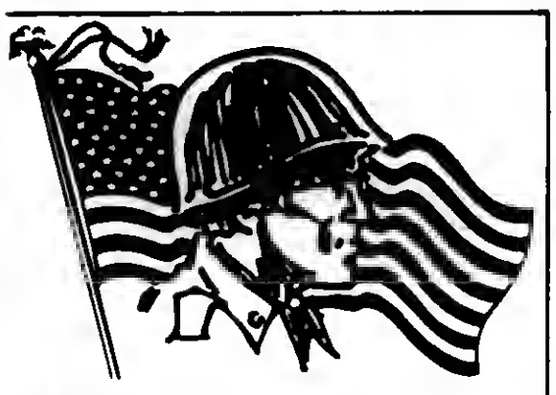
COLUMBUS, Ohio – Development is under way on a computerized data bank aimed at making research using laboratory animals more effective.

To be known as the Laboratory Animal Data Bank (LADB), the system is being devised by Battelle's Columbus Laboratories.

Baseline data from control animals used in laboratory research will be entered into the data bank and made accessible from computer terminals around the country. The LADB would allow researchers, breeders and others using laboratory animals to retrieve and analyze research data, a Battelle spokesman said.

Because LADB users generally will not be computer specialists, the data bank will be programmed so those not familiar with computers will be able to query the data bank with ease, he noted.

"If a user wants to search, retrieve, analyze and display or print certain data, a simple set of procedures will be available for assistance," he explained.



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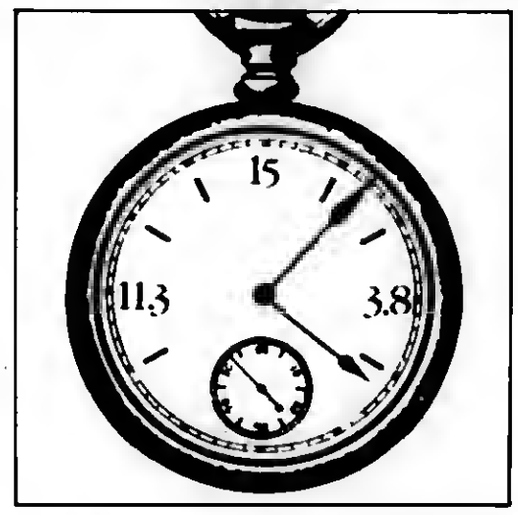
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Editorials

Not-So-Subtle Threats

Once a person's personal, financial and other information has been collected into a credit file, the person retains little control over the information.

Up to now the privacy laws have concentrated on giving the subject access to his file so unfair or incorrect data can be amended and corrected. But a recent court ruling in New Hampshire apparently decided a person has nothing to say about what happens to the file once it exists [CW, Sept. 24].

The ruling stated that a consumer's computerized credit file can be sold and resold (even to the consumer himself) at the whim of a credit bureau or anyone else.

Despite the existence of fair credit reporting laws at the federal and state levels (New Hampshire has one), the consumer has the right only to add statements correcting false information. But nothing more.

The case in New Hampshire centered on a letter sent to 60,000 persons whose credit files had been collected by the Credit Bureau of Nashua. The letter told recipients either they could pay $7.50 to buy the original copy of their file or it would be sold to a large data bank where almost anyone could gain access to their personal information.

The threat, which alluded to the dangers of data banks to make a person buy back information about himself, was interpreted as blackmail by some.

However, the provincial New Hampshire courts said the not-so-subtle threats were unfortunate, but they constituted neither fraud nor misrepresentation, as had been claimed by the consumer Protection Division of the N.H. attorney general's office.

And the courts ruled the credit bureau could sell the files it had on local residents without the permission of the consumers involved.

The New Hampshire situation may have helped us stumble onto important defects in current privacy protection laws.

It raised questions about who owns a person's file after it has been compiled – can that person be coerced into buying back data about himself, for example, and who decides when the file should be destroyed?

It is bad enough this kind of personal data can be collected without the consumer's knowledge. Now we must find a way to give the person control over the file once it exists.

A Note on Letters

Recently we have received a rash of anonymous letters on a wide variety of subjects, so it is apparently time to restate our policy on Letters to the Editor and Reader Commentaries.

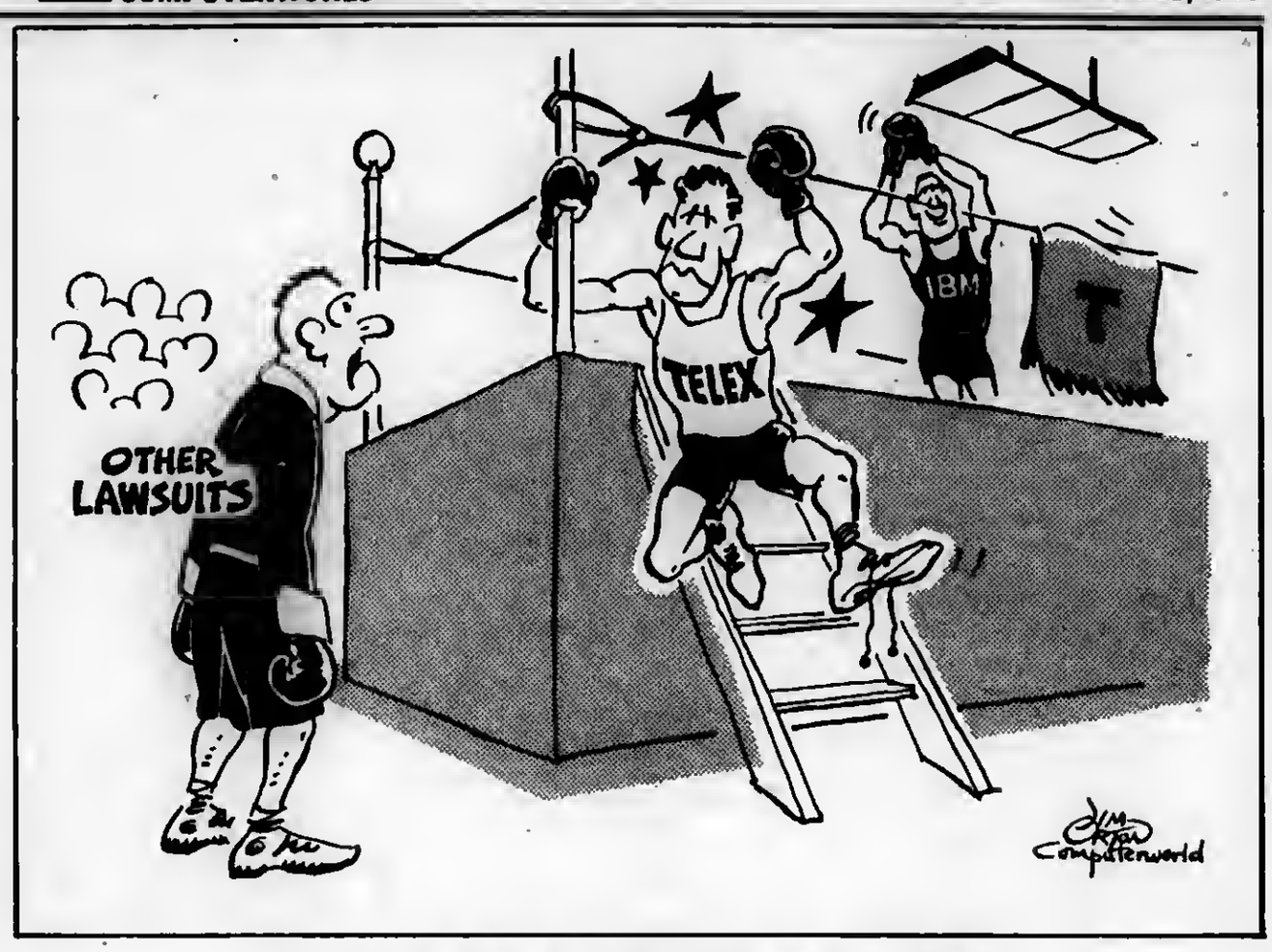
Computerworld welcomes and encourages a wide range of reader responses whether they agree or disagree with our editorial policy. After all, differences of opinion and viewpoint not only make for exciting horse races, but also for exciting reading. And we don't pretend to have all the answers.

Letters and commentaries, however, should be signed. We will withhold your name on request, but hope that most people are willing to stand by their convictions and let the world know where they stand on the diverse issues confronting the computer community.

Letters should be less than 150 words, while Reader Commentaries can run up to 1,000 words.

So, if you've got an opinion, write it down. Congratulate us or castigate our policies, but don't be neutral.

And back up your thoughts with your name.



'Couldn't You Have Worn Him Down a Little Longer?'

Letters to the Editor

IBM No Exception; All Vendors 'Conspire' to Influence RFPs

Computerworld will undoubtedly receive many shrill screams of outrage at the latest revelation of IBM's "unethical" practices, i.e., the "thwarting" of free and competitive bidding on the Hudson County, N.J., computer acquisition [CW, Oct. 8].

Actually, what CW has uncovered, at least from IBM's standpoint, is not a criminal act, but rather an example of outstanding salesmanship.

I was an IBM salesman whose territory consisted largely of tax-supported institutions and agencies at the state and local level.

After more than four years of selling (and not selling) to government accounts, one fact became crystal clear – approximately 90% of all requests for proposal (RFP) are "wired" before they ever hit the street.

It appears the IBM salesman in New Jersey did exactly what his management and even his competitors would expect of him. He sold the system and then let the county figure out how to buy it.

IBM's competitors are quick to contact the press or the district attorney when they lose out in a public sector procurement (remember Chattanooga?).

As a result, it appears to an outside observer that only IBM attempts such shenanigans. The simple truth, however, is that IBM's internal policies prohibit protesting such irregularities when IBM comes out on the short end.

One may rest assured *all* vendors "conspire" to influence RFP specifications in their favor; good salesmanship demands no less.

Houghton B. Hutcheson

Houston, Texas

Small Wonder Xerox Dropped Out

The Sept. 24 issue of *Computerworld* front-paged the possible use of data on Xerox Corp.'s departure from computer sales as evidence in the IBM vs. U.S. Department of Justice trial.

If the Xerox data is honestly presented, it will probably prove IBM is dominant – not just because it is so competent, though it is – but because the competitors are not.

A couple of years ago, a major service bureau was planning to install a brace of 370/168s. Until the 168s were operational, it needed a stand-alone time-sharing system to handle its rapidly increasing load – primarily APL and text editing. Digital Equipment Corp., Xerox and IBM were the three competitors, with Xerox offering what appeared to be a clearly superior machine at the best price.

The deliberations, which began in December, culminated in April with a letter of intent from the service bureau president to Xerox for delivery of a major time-sharing system that fall.

In the next 60 days, the decision was reversed, not so much because of IBM's actions, as the lack of action from Xerox.

A demonstration of the Los Angeles system never really came off, though it was promised a dozen times. A tape copy of the APL files, to be brought up on a system for benchmark runs, was lost for about a month. It was finally located in the mailroom on a Thursday afternoon, where it languished over the following three-day weekend. Yet the following Monday had been set as the absolute deadline for the benchmark runs.

The result should be painfully obvious to anyone who has tried to deal with a non-IBM vendor: IBM installed a 370/145 in August and Xerox lost out.

No wonder Xerox is dropping out of the computer business. No wonder IBM is so dominant.

Kent D. Kitts

San Mateo, Calif.

Price Increases Contradictory

It is interesting to note IBM has increased its prices on machines by 4% and maintenance by 9% [CW, Oct. 8].

The contradiction on this particular price increase is that IBM has indicated all IBM 370/125s, 135s, 145s, 158s and 168s are presently out of new production. This price increase, therefore, was based on used equipment and not based on new equipment. This particular price increase, therefore, must be due to an inflationary factor.

IBM's announcement of a 9% price increase in maintenance was also a contradiction because IBM claimed the 370 line of equipment was practically maintenance-free.

In summary, it appears IBM is writing price increases to its requirements for greater profits.

The justification in price increases appears to be one in which IBM is attempting to get its prices in line with future announcements of new systems of the "gap type," intermediate to the existing lines. Price announcements are coming faster from IBM than product announcements.

Timothy Allen

Summit, N.J.

White Hat Suits Grosch Better

The cynics and doomsayers are in disarray. Herb Grosch has caught the computer community napping, put on his white hat and made his first visible contribution to the readers of *Computerworld*. His description of how "To Run a Railroad" [CW, Sept. 24] was lucid and most welcome.

Perhaps someone in a position of editorial preeminence at CW will invert the order of the hats in Grosch's column logo. He might take the cue and give us a predominance of substantive information from a new light-headed point of view.

Jerry Chichester

Hartford, Conn.

Women on Top

"Sex Bias No Disgrace" says the headline over the Mooshammer letter [CW, Oct. 1]. But it *is* a disgrace, especially when it is encouraged by such poorly argued evidence.

Twenty years ago, women in DP were mostly keypunchers, right? Not on the scientific side – I'll come to that later. But in DP I think I'm not too far off. Ten years ago, lots of programmers and analysts, and all kinds of operations people, were women. A few managers, but not many, right? And today the percentage of women first- and second-level managers is substantial (and climbing).

Doesn't that tell us why men outnumber women "in first place," whatever that means, Mooshammer, you knot-head? If it doesn't, let me try another gentle hint. Niels Bohr, when asked how to convince the old preatomic physics professors of the usefulness of his hypotheses, replied that it was not possible, but that in the end everybody, even scientists, had to die. That's *not* in Bartlett, by the way!

The reason the gals don't prosper is the old men sitting on the promotion committees and in the managements above 'em. They, like Mooshammer, think women do best at typing and making coffee – but in the end, like the German physics profs, they die off. And as they do, the level of management that women in DP are allowed to enter increases. There will be female Al Zipfs and Jack Joneses in another decade or two; look at Ruth Davis, Jean Sammet, Sonya Anderson.

The first two came up on the scientific side, though, and thereby gave us one source of healthy professional advancement. In the sciences, and especially in the more esoteric ones – astrophysics, quantum chemistry – there never has been much chauvinism. At the turn of the century there were prominent women astronomers, including directors of (small) observatories. In physics, there has been a line of Nobelists stretching from Marie Curie to Maria Mayer. So when male astronomers and nuclear physicists began using electrical and electromechanical and relay and early electronic computers, they accepted the women professionals, starting with Aunt Grace of course, quite readily. Engineers, not quite so easily – they tended to regard people with degrees in math, men or women, as inferior to men holding one of the engineering degrees. But as women began to operate room-sized differential analyzers and the ENIAC and the SSEC, and to run early university computing labs as Marjorie Herrick did at Madison, that tendency slackened.

It is in the business world and in the even more conservative and chauvinist world of university administration (as distinguished from research) that the male diehards still prevail. But Bohr was right: in the long run, young people and young ideas survive and old curmudgeons like the undersigned disappear.

Of course, those youngsters in turn become old and try to sit on the heads of the even younger; to paraphrase de Morgan, ". . . and those in turn still younger ones, and so *ad infinitum*." So women next century may be cruel to androids, or whatever succeeds them at the bottom of the totem pole. Oops, human chauvinism: I mean "whoever," don't I? Sorry, robots!



Herb Grosch

If Claims Prove True

Deeds Check-Digit Method Possibly Valuable DP Tool

A report on a new check-digit computation method that, although unpublished, has been used successfully for three years in Tampa, Fla., was one of the many responses received as a result of the recent column on checking check digits [CW, Sept. 17].

The Taylor Report
By
Alan Taylor, CDP



If it lives up to its claims, it will provide the only method suitable for varying length numbers anyone appears to have heard of that catches all single-digit errors and all adjoining-digit transpositions.

By contrast, the earlier methods discussed (and apparently all weighted-multiplication methods) fail to detect at least one set of transpositions. For instance, in the case of the Darmstadt method mentioned, any transposition between 09 and 90 would not be caught.

The weakness of the traditional methods lies in the use of multiplications to find the check digit. As noted in the earlier article, only a few of the 10 digits provide unambiguous single digit results.

Most, like zero, five, two, four, six and eight provide more or less ambiguity, and this results in some single-digit errors or transpositions escaping detection.

The new method, developed by J.B. Deeds of Digitex, Inc. avoids this simply by not using multiplications, in the traditional sense at least.

Two tables can be used to find Deeds' check digits. The first, shown in Figure 1, provides for the original number to be coded into a different form having the same length as the original number.

Position	Units	Tens	Hundreds	Thousands	Tens of Thousands	Hundreds of Thousands	Millions	Tens of Millions	Hundreds of Millions	Billions
Digit To Be Coded										
0	0	0	0	0	0	0	0	0	0	0
1	1	4	1	4	1	4	1	4	1	4
2	2	9	5	6	7	2	9	5	8	7
3	3	6	3	6	3	6	3	6	3	6
4	4	1	4	1	4	1	4	1	4	1
5	5	8	7	2	9	5	8	7	2	9
6	6	3	6	3	6	3	6	3	6	3
7	7	2	9	5	8	7	2	9	5	8
8	6	7	2	9	5	8	7	2	9	5
9	9	5	8	7	2	9	5	8	7	2

Figure 1. The coding method described is based on the above table. To code a number, simply replace each digit in the original number with the entry cross-referenced by the original digit and the position of the digit (units, tens, etc.). The result will always have the same length as the number being coded. For numbers longer than 11 digits, the table is repeated, the units column values being used as the tens of billions values, the tens as the hundreds of billions, and so on.

To use the table to code a number, simply find the number in the position row (units, tens, hundreds, etc.) and the digit column of the number to be encoded. Thus, the code for 4321 is 1391, and that for 5875462 is 8882432.

Having created this coded form of the original number, a single-digit value corresponding to this form is found using a second table, Figure 2.

This table provides for the reduction of pairs of numbers to single digits, and successive applications of the table permit numbers of any length to be reduced to a single value.

In the Deeds method, these reductions are carried out from right to left, and the first pair is made up of an assumed "0" after the units number.

In this way, 1391, the coded form of 4321, is first expanded to 13910 and then successively reduced to 1394, 136, 10 and then 4.

This single-digit value, corresponding to the original number, 4321, is now used to select a check digit.

The selection is done by adding zero to the right of the single-digit value and reducing this pair to the final check digit. This value being 1, the check digit for all numbers which have single-value codes of 4, as 4321 has, is 1.

Left / Right	0	1	2	3	4	5	6	7	8	9
0	0	4	9	6	1	8	3	2	7	5
1	1	0	6	5	2	7	4	3	6	9
2	2	1	7	9	3	6	0	4	5	8
3	3	2	6	8	4	5	1	0	9	7
4	4	3	5	7	0	9	2	1	8	6
5	5	9	4	1	6	3	6	7	2	0
6	6	5	3	0	7	2	9	8	1	4
7	7	6	2	4	6	1	5	9	0	3
8	8	7	1	3	9	0	6	5	4	2
9	9	8	0	2	5	4	7	6	3	1

Figure 2. The reduction method described uses the above table. Reduction takes place by replacing a pair of digits with a single digit. The right-hand digit of the pair is used to indicate the row address of the replacement digit and the left hand number the column address. Thus the pair 05, when reduced, will be replaced by 5, but the pair 50 will be replaced by 8.

Checking Method

Checking a code proceeds approximately in the same way. If a number such as 789 appears with a check digit of 2, the 789 is coded to 979, using Figure 1, giving a full number of 9792. This is then successively reduced (using Figure 2) through 978, 95 and eventually to zero as the single value. This final zero value is the check – anything else indicates an error of some sort.

The math of the method aside (they involve such esoterics as letting "*" be the multiplication operator on the D[0, . . .9] such that (D,*) is isomorphic to the group of symmetries of the pentagon, the potential importance of any improvement in check-digit science is certainly large.

Items still get posted to wrong accounts these days and, as long as this is so, any improvements in computer science that reduce such problems must be welcomed. Whether the Deeds method is really as good as it claims to be, I still don't know, but it is certainly a new and potentially very valuable addition to our computer armory.

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Information Science

Failure in the Midst of Success Can Be Very Special Kind of Pain

By Miles Benson
Special to Computerworld

This is a "Project Which Failed" story – in spades.

Not only did the project fail, but the originators had their noses rubbed in it.

And it's still happening.

The Sociology of Computing

Fly-High Cosmocorp is one of your run-of-the-mill aerospace companies. It may be located in San Diego or Seattle or St. Louis or on Long Island, but it doesn't really matter for this story. When it's on an employment high, the surrounding area blooms like an oasis. When contracts dry up, the whole area becomes a Sahara.

Fly-High, like most companies that rely heavily on research and technology, places a great deal of importance on its library. It doesn't just stock it heavily with relevant textbooks and periodicals and conference proceedings and monographs; it doesn't just put it in a central, convenient location with good telephone service; it doesn't just ensure that the area is quiet, a place where a technologist can go and really think. It also optimizes the access process.

Just in Time

A lot has happened in library sciences in recent years; I don't pretend to understand most of it. But with the advent of the computer, doing a complete information search against a thorough information data base has suddenly become a very fast and feasible thing.

And just in time, too . . . the information explosion, especially in the technological world, is nothing short of awesome.

Fly-High was enough at the forefront of its field back in the late '60s that it knew automated library access and information retrieval were essential to its business. And although library people and computer people at first seemed like strange bedfellows, it was more than politics which caused Fly-High to get them together to begin analyzing the problem.

Fortunately for Fly-High, the library and computer people it had were both innovative and down-to-earth. They designed an access and retrieval system that was well in advance of the state of the art. They built the system, and tested it, and proved that it would work.

They put it into use in the Fly-High library. They called it Infotriev. And the users were so pleased that the implementors even wrote a paper on it and presented it at a Joint Computer Conference that year.

Remember what I said about aerospace employment, and oases, and the Sahara? If you weren't part of it, you may not remember the aerospace industry trauma of the turn of the decade which followed. But in 1969 and 1970 and even into 1971, the area around Fly-High almost blew away with the sand.

It wasn't just a little old aerospace cutback; the layoffs this time cut to the quick. People were surplused in droves; facilities were closed; office furniture was sold at auction.

Managers who hadn't done technical work in years found themselves back in the bullpen, trying to remember how to use a slide rule or a drafting table; technologists met and swapped notes in the unemployment line.

Staff Not Spared

The Infotriev staff wasn't spared. In the overall scheme of things, library science wasn't at the top of the corporate priority list – survival was. There was no immediate revenue available from information retrieval, only expenses.

The library and computer team scattered with the sand. Some landed at other aerospace companies; some went into teaching or into other library systems; a few scrunched down and weathered the storm.

In the midst of one of those aerospace layoffs, it seems like it will never end. People swear they will never work for another aerospace company. It does end of course, and some of the people return, but not all.

So it was with the Infotriev team. When the storm cleared and the aerospace skies once again grew bright, some of the information retreival folk came back. But most did not.

Classic Dilemma

And that left Fly-High with a classic dilemma. It needed a system like Infotriev because research and technology and long-term goals were just as important as they had been before. But, without key members of the team, how could Fly-High resurrect it and keep it going?

The truth of the matter was, it couldn't. Infotriev was hot off the presses when the layoffs hit. The system worked, but the documentation was never completed. Even the source code was mislaid in the layoff crunch.

It was only a matter of time before Infotriev needed a vital correction and modification. And no one could fix it.

Now comes the really painful part. It wasn't just a matter of doing without an information retrieval system. Fly-High had to have one. With Infotriev out of order, the only reasonable solution was to buy one.

And so it did. Fly-High now has a good, off-the-shelf, state-of-the-art information retrieval system, built and maintained by a major software company. The library users are pleased, and most don't know the difference.

But there are a few, just a few, of the old Infotriev team around and, when they need library services for some other project they're involved in, they wince a little in pain. It hurts to know that the fine, innovative project they built not only failed, but has been replaced by a less sophisticated competitor.

It seems a long time since they were presenting Infotriev to an excited audience at a Joint Computer Conference.

Failure is always painful. But failing in the midst of success is a special kind of pain.

Letters to the Editor

No Job for DPer

I agree with H. Richard Winkler's thesis [CW, Sept. 24] that the Internal Revenue Service (IRS) changes to the W-2 form appear largely unnecessary and very costly to industry. It is really incredible that industry sits back and does little to influence the IRS to stabilize the W-2.

But what we *don't* need is for W-2 forms to be designed by a "DP layout artist." Some of the worst designed forms I have ever seen have been developed by so-called computer/programming experts.

The W-2 should be designed, free from external or political pressures, by professional forms management personnel who are knowledgable with DP requirements. The IRS should solicit the advice and counsel of forms professionals who are members of the Business Forms Management Association.

J.W. Morris

St. Louis, Mo.

Michaelson Award Winner

Management Next CPE Concern: Bell

By Don Leavitt
Of the CW Staff

SAN FRANCISCO – The development of computer performance evaluation (CPE) has been a "grand cooperative effort" and "a lot of fun," but problems that still exist are "bigger than we are," according to Dr. Thomas E. Bell Jr., winner of this year's A.A. Michaelson award.

The senior staff engineer at TRW Systems told a luncheon session of the Computer Measurement Group (CMG) – which presented the award "on behalf of the entire CPE community" – more work is needed in technical areas and in the way CPE supports and works with management.

"Any CPE effort that is able to cut a Fortran program execution time by 75% isn't tuning the darn thing. It's really debugging it," he noted. "We've got to be doing more than that."

One of the major research areas should be concerned with large data bases, Bell said.

It isn't at all surprising that various speakers at CMG technical sessions had described data bases that had grown from a billion bytes to 30 billion bytes, with every prospect of eventually growing to 300 billion bytes, he said.

"Maybe this is the way it should be, but do we really know what is happening in these situations? More understanding is certainly needed in this area," he said.

Networking has been under study for about four years now, and much has been learned on problems such as load sharing and the like.

But there are questions, Bell said – How does this really differ from the problems in multiprogramming and multiprocessing? This, in his view, is a severe problem, especially as more and more installations move into teleprocessing mode.

"And what about the communications between the CPU and the user?" be asked next. There is a cost – often a real cost – when the lines of communication break down. For example, Bell asked, "What happens when a remote user gets frustrated by extended response times?

"If he kicks the terminal – and that happens – can we set up a new metric relating the cost of terminal repair to the slowdown in response time?" He admitted being somewhat facetious in the specific question, but said it serves to illustrate that the user has to be considered in any real CPE work.

But the thing that pervades all other considerations – in Bell's view – has to be closer work with management.

A specific technical goal "like more CPU utilization" is the wrong objective, unless there is a known underlying reason for that request, he said.

(Continued on Page 14)



This is the Bell whom CMG extols.

State Farm Plans Reap Large Savings

By a CW Staff Writer

SAN FRANCISCO – State Farm Automobile Insurance Co. has one of the largest computer performance evaluation (CPE) staffs outside the Federal government, according to Barry Merrill, senior systems analyst.

CW at CMG

Addressing a Computer Measurement Group technical session on how to set up such groups, he said his staff included 12 people, half of them senior level, until "we ourselves went through an evaluation study this summer. Now we have 10 people."

They are working on a massive dual IBM 370/168 installation, with 168 spindles of disk and 60 tape drives shared by the two processors.

They also oversee a 155 at the company's central site in Illinois and a wide collection of gear in 26 regional offices across the country. The 155 is used heavily in 1400 emulation, he said, but sober consideration of its workload make a rewrite of the programs a completely unreasonable alternative.

Though they haven't updated the 1401 programs on the 155, his group has been busy – and effective, he said. Recently, he plotted results they had achieved, Merrill said, and these included a 60% increase in production runs and Time-Sharing Option (TSO) sessions, with declining costs, since April 1974.

More than that, there is still capacity available and the average TSO response time has remained "just about constant." In accomplishing all this, State Farm has not had to acquire any new hardware – "on the contrary, we have released some," Merrill noted.

Place in Organization

His place in the organization at State Farm certainly has had something to do with his group's success, the analyst said.

This arrangement puts Merrill on the same management plane with the managers of TSO, system control programming and data communication, with whom he must and does work very happily.

State farm got into CPE early, starting a research effort in 1971, Merrill said. This led to a proposal for a step-by-step study of the various CPE tools and techniques then available, which was completed and accepted by May of 1972.

That proposal described what the group would consider and committed Merrill and his crew to coming to a definitive decision – for or against – each of the tools and techniques on a planned schedule. By July of that year, for example, a proposal advocating use of accounting tools was done and accepted.

Throughout the rest of that year and up to May of 1973, the group studied, proposed – and gained approval to acquire – a systems monitor, program monitor, a simulation package and a hardware monitor.

'Big Dollar' Payoffs

That amounts to a lot of CPE staff work and a lot of CPE equipment, but it has had very specific "big dollar" payoffs with real tangible, documentable situations.

In the third quarter of 1973, for example, the company's Ramac fixed-head

(Continued on Page 14)

CMG Seeks Role as User Umbrella Group

By a CW Staff Writer

SAN FRANCISCO – Like a butterfly shedding its cocoon for a new kind of life, the Computer Measurement Group (CMG) earlier this month sbed its old identity as the Boole & Babbage Users Group (BBUG).

The changeover – made at the group's annual conference here – is more than a cutting of ties with the vendor that originally fostered the group some five years ago.

The change is important because it emphasizes the group's desire to become a major and useful organization within the field of computer performance evaluation (CPE) President Donald R. Deese explained.

The emergent CMG wants to work closely with all other groups concerned with CPE and to provide an umbrella structure so that all the groups can work more effectively with all vendors serving this aspect of DP, Deese said.

A director at the Federal Computer Performance Evaluation and Simulation Center (Fedsim), he said CMG, as now set up and as planned, has the potential to become the largest single organization of "real practioners" of CPE work, and it will not have the sometimes awkward dependencies on any single vendor.

Deese said he hopes to have 800 members or affiliates within three years.

Cooperation With Other Groups

CMG should work with groups like the Association for Computing Machinery's (ACM) Sigmetrics and the IEEE Computer Society's software engineering unit, recognizing their right to be more theoretically oriented than CMG, Deese noted.

The kind of cooperation CMG hopes to foster is illustrated by tbe consultations that went on in selecting the winner of the A.A. Michaelson award.

Presenting the award, Michael Morris said he checked with the leadership of most of the other groups before he was satisfied the award to Dr. Thomas E. Bell Jr. represented the consensus on the entire CPE community and not just CMG.

Regional Groups

In addition to working with other national groups, CMG has established a mechanism to work with and encourage expansion of a growing string of locally organized, regional CPE groups that meet more frequently and, generally, with less formality than the big organizations.

Ex-president Barry Stevens of Peat, Marwick, Mitchell and Co. proposed such regional "workshops" at last year's BBUG national conference in Montreal and organized the first in New York City earlier this year.

That was to be a test operation to be evaluated at this year's national meeting. But somehow things didn't work that way, and Stevens and CMG couldn't be more pleased; a midwestern CMG is flourishing in Chicago and a southeastern

(Continued on Page 14)

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Technical, Management Areas Remain Concern of CPE

(Continued from Page 13)

There is no agreement at all on the meaning of the word "performance," he noted. That being the case, "what is the right thing to ask of the system?" he asked.

Restating a concern expressed at the recent Computer Performance Evaluation Users Group meeting [CW, Oct. 8], he urged more concern for human factors that affect computer performance "almost more than all the tuning we can ever do."

This is "an expanded view of CPE," he acknowledged, but it is one that has to be followed.

Neither mainframe vendors nor CPE technicians understand billing problems completely, though almost every installation has some sort of mechanism by which it bills its customers or at least tallies how its resources were used.

But variability in billing results for the same program in different job mixes is understandably a concern to users and should be to CPE types as well, he said.

Other types of activities need to be subject to more formalized study and perhaps to the rigor of operations research methodology, he said. "It is up to us to bring reality to each new panacea offered," he said. CPE must be able to provide objective evidence – pro or con – relative to any of these claims.

There must be better agreement on who should set the objectives of a CPE effort, he said.

"We need to find out what that mission really is, Bell said. There are lots of integration problems still unsolved. But "we can solve most of them if we adopt a managerial approach, rather than demanding that managers learn our ways."

The Michaelson award, first given last year, is presented to the individual who, in the view of a screening committee, has made the most significant contribution to the advancement of computer systems measurement.

The citation accompanying Bell's plaque noted he had founded the Share Computer Measurement and Evaluation Project and led it through its first five years, developed the field of CPE through orientation and sponsorship of resolutions to "the major computer system manufacturer" and documented and developed the procedures for evaluating and measuring computer performance.

He also had guided the development of special hardware measurement devices through their design stages, adopted the classical scientific method to identify and solve computer system performance problems and incorporated classical production control techniques to the management of computer system performance, the citation said.

Super User Group Seen CMG Role

(Continued from Page 13)

regional group is becoming established in Atlanta.

An independent Measurement and Evaluation Group (MEG) set up here is now at least considering affiliation with CMG. Others in major cities "would certainly be welcome," Deese added.

An indication of CMG's determination to become a member-oriented organization lies in the newly accepted definition of member qualifications.

Anyone can be a member, according to these rules, by attending the annual national conference, contributing an article for the transactions, attending two regional workshop sessions or "if all else fails," according to Deese, by paying a membership fee.

These options are renewable annually,

CW at CMG

he noted, so that a single act of support isn't enough to keep a person on the group's lists.

Elected to two-year terms along with Deese were Linda Wright of Sun Oil (vice-president), David Morley of Boole & Babbage (secretary) and Ian K. Roome of McDonnell Douglas Automation (treasurer).

Directors elected were Dr. Thomas E. Bell Jr. of TRW Systems and David Schumacher of Lockheed Missiles and Space for two-year terms and Michael Morris, an independent consultant, and Phillip Howard, publisher of *EDP Performance Review* for one year each.

CMG's mailing address is c/o Deese, 4812 Sharon Road, Camp Springs, Md. 20031.

Planning Carefully Reaps Large Savings

(Continued from Page 13)

disk subsystem was replaced – "for a clear savings of $1 million."

In the second quarter of 1974, various 360/30s were replaced by Model 40s, accounting for a saving of $43,500. And, in the fourth quarter of that same year, a study recommended against the purchase of a software package to which the company was nearly committed. Savings here? $18,000.

$2 Million Savings

The company released a 370/155 early this year when a CPE study showed it wasn't needed. That saved $2 million, Merrill said, and a TSO change about the same time added $10,300 to the total of money not spent.

Changes in alternate channels and in the disk controller in the second quarter of this year have led to dropping of continuing charges of $60,500 and $5,300 each year, he noted.

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Duquesne, Boole & Babbage Products Get MVS Support

By Don Leavitt
Of the CW Staff

SAN FRANCISCO – Vendors of computer performance evaluation (CPE) tools were invited to make presentations in conjunction with this year's annual Computer Measurement Group Conference and half a dozen accepted.

Two vendors used the occasion to announced enhanced versions of previously available products, and both releases are designed to provide support for "Multiple Virtual Storage (MVS)" users under IBM's OS/VS2.

CUE, DSO and QCM

Boole & Babbage, Inc. said it has added MVS support to both Configuration Utilization Evaluator (CUE) and Data Set Optimizer (DSO). Duquesne Systems, Inc. has added the support to the timing, systems performance and job accounting modules of the Quantitative Computer Management (QCM) package, a spokesman said.

CUE for MVS is said to provide the same measures of CPU, channels, devices, queuing and head movement as the "old" CUE, as well as new ENQ/DEQ and virtual storage usage measures.

The ENQ/DEQ measures will show the percentage of time a task is enqueued against any resource as well as the percentage of time other tasks are forced to wait because of this enqueue, Boole & Babbage said.

The virtual storage usage measures show paging and swapping activity and use of both virtual and real memory.

DSO shows the head movement activity between data sets on a pack and calculates a proposed reorganization of the pack to minimize such movement. A very simple repacking of critical data sets can "very often" result in a "vast improvement" of system usage, the vendor said.

For its part, Duquesne said it has extended the QCM event-driven timing approach to measure all CPU and I/O activity taking place in all MVS address spaces.

In addition to task control block (TCB) and supervisor request block (SRB) timing, QCM measures CPU time required to process I/O interrupts. It also associates that time with the address space and task that initiated the I/O interruption, Duquesne added.

The QCM/MVS includes logic enabling the installation to specify as many unique types of I/O time accumulators as the installation feels necessary.

The QCM timing module has been upgraded to support multiprocessor system problems while they are actually happening, the vendor said.

Boole & Babbage is at 850 Stewart Drive, Sunnyvale, Calif., 94086, while Duquesne is at 1511 Park Building, Pittsburgh, Pa. 15222.

CW at CMG

DPers Urged to Start 'Kidding Around' More

SAN FRANCISCO – Data processing people "are too damned adult. They just won't let the kid hang out" and that's what gets in the way of their communicating with the people they should be helping, according to the speaker at one of the Computer Measurement Group (CMG) luncheon meetings.

Utilizing the terminology of "Transactional Analysis" – which sees each person subject to three separate internal forces (child, parent and adult), Gerry Richardson of Richardson Associates said DPers are too analytical and not social enough to work effectively with others.

For example, systems analysts are "great" in developing the detailed processing steps within the systems for which they are responsible, he said. But they are "lousy" in talking to the people who should help in the design of the system and to the people who are expected to use the output once the system is in place.

The result of this narrow capability is often creation of a "green box" when a "black box" is needed, Richardson said. He admitted, however, his criticism does not apply equally to all analysts; some are well tuned to their roles.

An independent consultant who describes himself as a "catalyst" interested in attitude modification, not just behavior change, Richardson reminded his audience of the psychological games people play with each other. These are generally subconscious, but people must become aware of them because of the bad payoffs that result from them.

Detailing the workings of several of these "games," he urged the CMG members to avoid still another. "Don't go back to your organizations with the idea of catching your employees – or your boss – playing these games."

Each person must, instead, concentrate on his own attitudes. No one can make someone change his or her attitudes; that person can only do it by himself or herself. Recognizing this "ownership of feelings" can be extremely useful, he added.

Instead of being upset by someone else's attitude about a new project, Richardson said an analyst should recognize the negative attitude is "the other guy's problem."

Read All About It – But Not Yet

SAN FRANCISCO – The committee in charge of this year's annual conference of the Computer Measurement Group (CMG) has not yet received copies of all the presentations made at the 3-1/2-day meeting.

Spokesmen expect it may be another "six to eight weeks" before all the material is in and the full proceedings can be printed.

Once the documentation is ready, however, copies will be available for general distribution for $30 each, according to CMG Treasurer Ian K. Roome.

Requests should be addressed to Roome at McDonnell Douglas Automation-West, 3855 Lakewood Blvd., Long Beach, Calif. 90846.

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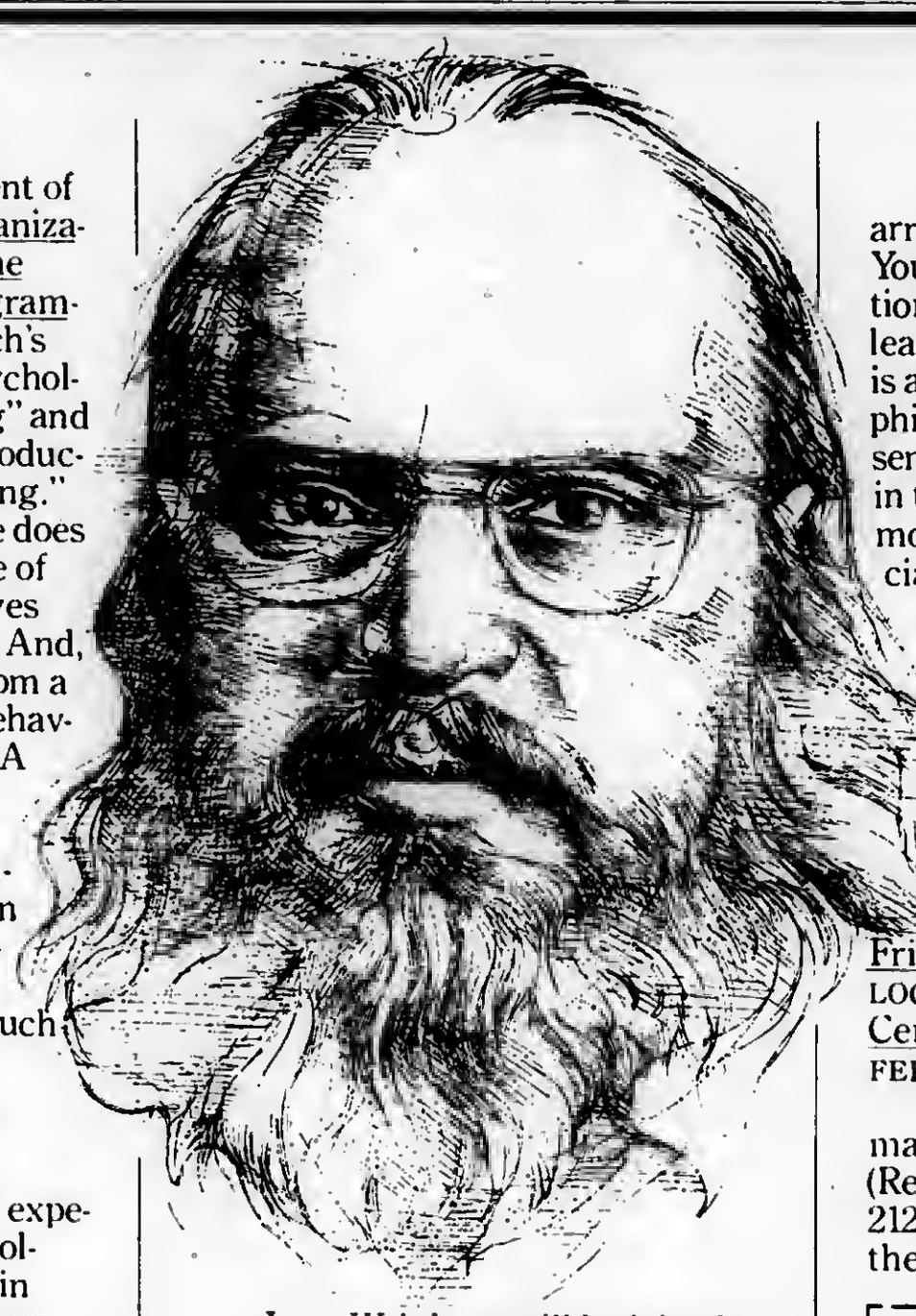
Jerry Weinberg and his associates will conduct Ethnotech's highly regarded Technical Leadership Workshop the week of Nov. 30–Dec. 5 in Tarrytown, N.Y. The entire program has been arranged under the auspices of Yourdon inc. Enrollment will be strictly limited.

THE TEACHER

Jerry Weinberg is the president of Ethnotech—the leading organization in the world today on the human factor in computer programming. He has outlined Ethnotech's principles in his book, "The Psychology of Computer Programming" and the recently published "An Introduction to General Systems Thinking."

But the written word alone does not provide an adequate picture of this approach. Ethnotech believes people can be more productive. And, that this productivity results from a delicate balance of technical, behavioral, and humanistic learning. A balance all too often ignored in ordinary computer training.

The effectiveness of this individual approach as reflected in the Technical Leadership Workshop was best put by a student who complained, "Lunch was much too long."



THE WORKSHOP

The Technical Leadership Workshop has grown out of the experience Jerry Weinberg and his colleagues at Ethnotech have had in over 60 person-years of consulting and training in various organizations throughout the world.

The Workshop lasts five-and-a-half-days. Classes will last each day from 9 a.m. to 1 a.m. (16 hours)—a total immersion experience for students and instructors.

The Workshop will concentrate on the technologies of open egoless cooperative programming, programming teams, structured programming, and top-down program design and development. The approach to these subjects involves each student in problem-solving activities that will ultimately have practical application.

Each day will involve: technical material; survey of literature; discussions; exercises; peer review practice; introduction strategies; and simulation gaming to teach means of overcoming resistance, avoiding pitfalls, and recognizing counter indications.

Jerry Weinberg will be joined by one or more of his Ethnotech colleagues, who include such noted instructors as Don Gause, Tom Plum, and Daniel Freedman.

THE RESULTS

In previous offerings of this course, 183 of 216 participants rated it "the best educational experience ever." In many cases, the resulting work improvement by course participants in their respective organizations has repaid the course investment many times over.

Here are some student comments on Weinberg's Technical Leadership Workshop: "a tremendous experience in introspection. Thank you." "This course has made me see the people I work with in a different light." "A fascinating course—unlike any I've ever taken—and better." "A profound educational experience."

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The entire program has been arranged under the auspices of Yourdon. We are proud of our affiliation with Jerry Weinberg and his colleagues at Ethnotech. We feel it is another example of Yourdon's philosophy of bringing you first-rate seminars taught by the finest minds in the computer industry today. In the months ahead, Jerry and his associates will be teaching a number of additional courses in conjunction with Yourdon.

THE PARTICULARS

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COMMUNICATIONS

For Packet-Switched Network Users

Missing Access Interface Standards Creating 'Monster'

By Ronald A. Frank
Of the CW Staff

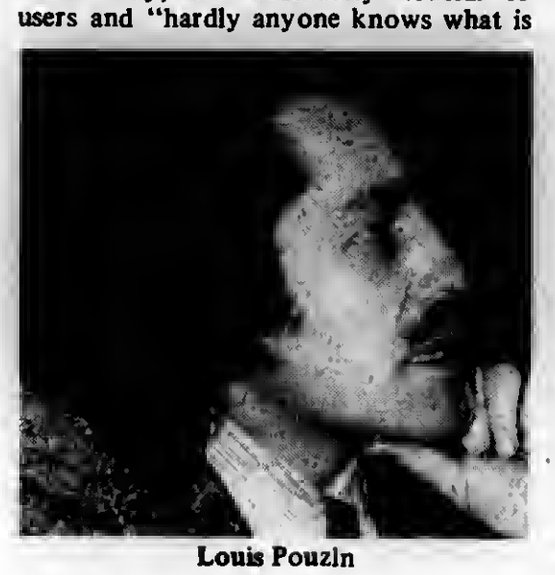
QUEBEC CITY – The lack of standard access interfaces for emerging public packet-switched communications networks is creating "some kind of monster" for users.

This was the warning sounded by Dr. Derek Barber, chief of the new European Informatics Network, at the fourth biennial Data Communications Symposium held here recently by the Institute of Electrical and Electronic Engineers (IEEE) and the Association for Computing Machinery (ACM).



CW Photos by R. Frank
Derek Barber

Discussions on proposed standards, now under way, are absolutely crucial to users and "hardly anyone knows what is going on," Barber said.



Louis Pouzin

An international communications maintenance organization is needed to bring some semblance of uniformity to packet-switched network methodologies, "but there is absolutely no chance of that happening," Barber told the more than 200 data communications experts attending the symposium.

Whatever standards evolve from current discussions will be set by three or four carriers and neither users nor manufacturers will have a chance to comment, according to Louis Pouzin, director of both the Cyclade packet-switching network and the Institute de Recherche d'Informatique et d'Automatique in France.

CW at Data Symposium

The present few packet-switched networks, operated by postal authorities in Europe, are forcing users to switch to new communications jargon several times a day just to keep their equipment compatible with the networks, Pouzin said.

If these network incompatibilities continue, Pouzin warned, the user will have to go to a middleman just to perform the internetwork interfacing.

The user is most interested in using his own terminal. While this should be a simple approach, it is becoming increasingly difficult in the absence of uniform standards, he said.

'Magic Boxes'

"The only rational approach is to set international standards before we get pushed back into the dark ages of communications," he added.

What is needed is a good, simple packet-transport system that will enable users to utilize their higher level protocols on packet-switched and other transmission networks. If standards are not set, the user will have to rely on vendor's "magic box" terminal controllers to interface them to the public packet nets, Pouzin said.

Work on the necessary standards has not yet even begun within the International Standards Organization (ISO), he said. The current methods, which include an end-to-end protocol, virtual call approach, and various file transfer methods, are a "hodgepodge," he added.



Ira Cotten

Ira Cotton of the computer networking section at the National Bureau of Standards said it is "moderately urgent" to set up standards for interfacing between networks. Since the carriers are providing the packet-type services, they will have to take the initiative, he said.

(Continued on Page 18)

Battle for Access Standards Has Two Sides

By Ronald A. Frank
Of the CW Staff

QUEBEC CITY – The battle for packet-switched network standards revolves around two different access procedures now being implemented by carriers – the datagram and virtual call access methods – and users have an important stake in the outcome, according to Louis Pouzin, director of the Institute de Recherche d'Informatique et d'Automatique in France.

Pouzin is also director of France's Cyclade packet-switching network.

The way in which the packets nets are accessed is important because the European postal, telephone and telegraph authorities are determined to force data users onto these new services, Pouzin said at the fourth biennial Data Communications Symposium held here recently by the Institute of Electrical and Electronic Engineers (IEEE) and the Association for Computing Machinery (ACM).

Initially, the packet nets will be more expensive than private-line nets but, as more traffic develops, costs will drop, Pouzin predicted.

The strategy of the carriers will be to raise private-line rates, which in turn will force users onto the packet nets. Any U.S. data communications users planning to operate in Europe will therefore have a stake in the final access methods that are adopted, he said.

Complex Differences

The differences between the datagram and virtual call methods are complex. Basically, however, the datagram access to a network allows the user to just send his message; the carrier assumes responsibility for accepting the data onto the network.

In contrast, the virtual call method, also called the virtual circuit, requires error and recovery procedures by the user or carrier to break up and reassemble packets.

In the virtual call system, the user has to superimpose a monitoring method for his transmitted packets over his actual data.

(Continued on Page 18)

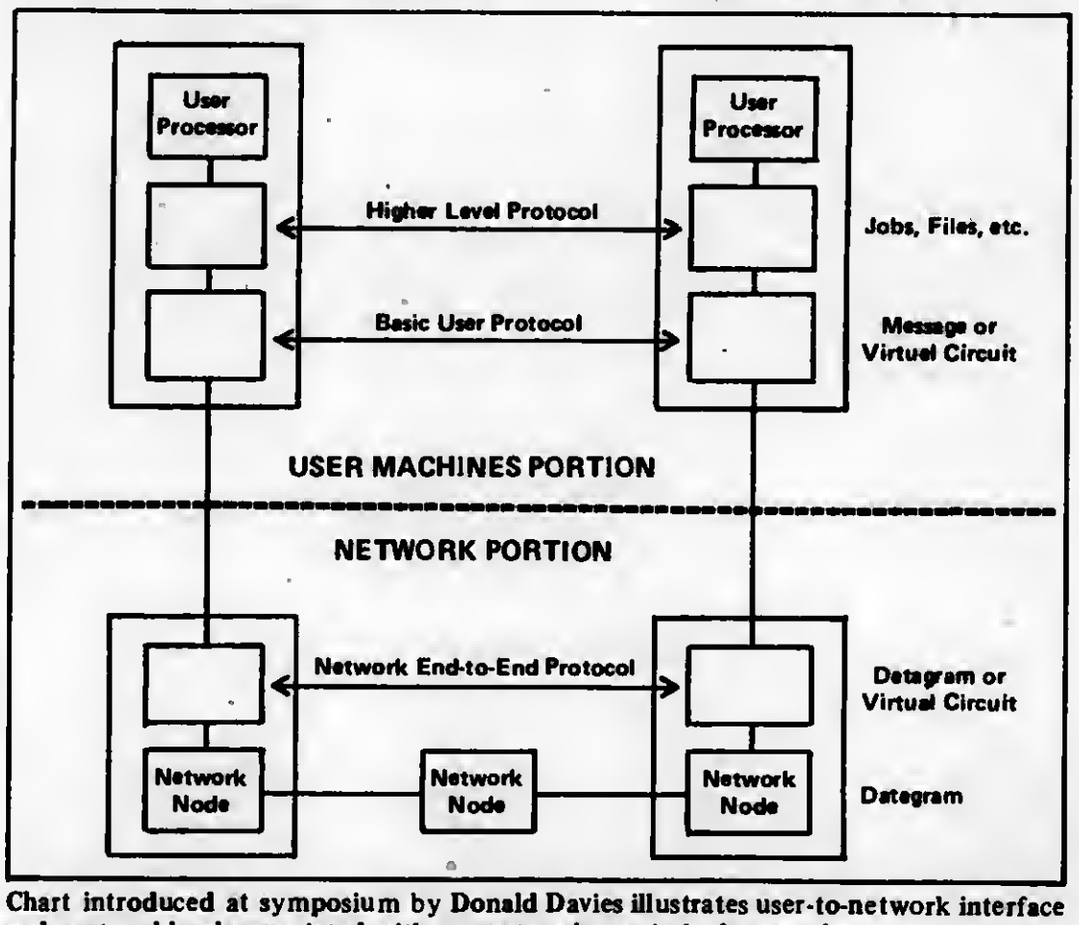


Chart introduced at symposium by Donald Davies illustrates user-to-network interface and protocol levels associated with current packet-switched networks.

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Security Problems Still Plague Packet-Switched Nets

By Ronald A. Frank
Of the CW Staff

QUEBEC CITY – Despite years of development, packet-switching networks have security and other operating problems.

Recent cases have come to light where packet-switching networks have been compromised because of "malicious congestion," according to Dr. Donald Davies, superintendent of the Computer Science Division at the National Physical Laboratory in England.

In one case, a state-run betting network was deliberately congested to allow bettors to take advantage of updated odds. Satellites are very vulnerable to this type of congestion compromise, Davies told the fourth biennial Data Communications Symposium held here recently.

In order to minimize the possibility of network compromises, extensive experiments have been undertaken to simulate the characteristics of packet-switched nets run on the threshold of saturation, he said. Some of this simulation work is being done at the National Physical Laboratory.

One current operating theory is to run packet nets at a continuous level at or near saturation by introducing traffic when none is being generated by real users, he said. With more or less constant traffic loads, the behavior of a packet-switched net is more predictable.

Many of the general-purpose packet network protocols now being considered will not be appropriate for transaction-oriented traffic, Davies said. Short message traffic such as that generated by point-of-sale and banking users will have to be run using protocols which are application-dependent, he added.

The Arpa network developed by the Department of Defense is not user-oriented but communications-oriented, according to Frank Kuo of the University of Hawaii.

Hosts can't get onto a network unless they are prepared to share part of their resources – and resources can't be shared unless there is a machanism to pay for it, Kuo said.

The Arpa net lacks this consideration. In addition, it needs privacy and security standards to protect files and guard against unauthorized access, he said.

There has to be a way for a novice to log on and get into the network resources. But once a user gets stuck in a subsystem of the Arpa net, he may not know how to escape, he said.

Often on the Arpa net packet-switched system, the user knows that trouble exists but doesn't know what to do about it. A "net trouble" message doesn't tell the user when the trouble will be fixed, Kuo noted.

A lot of hand holding is required on a system like the Arpa net. The user is much more concerned about reliability than he is about solving the virtual circuit question, Kuo said.

CW at Data Symposium

Fourth in a Series

QUEBEC CITY – The Fourth Data Communications Symposium, part of a biennial series begun in 1968, was sponsored by the Association for Computing Machinery (ACM), IEEE Computer Society and the IEEE Communications Society.

Dr. Fred Glave of Bell Northern Research was general chairman and Prof. Wesley Chu of the University of California at Los Angeles was program chairman.

Battle for Standards Centers on Methods

(Continued from Page 17)

This is more complex and costly than the datagram, Pouzin explained.

The datagram fits into existing network standards and the carrier controls the packets. This makes the transmissions transparent to the users.

The best example of the datagram approach to date is the Datapac network soon to be implemented in Canada, he said. But pressure from the PTTs in Europe has now caused the Canadians to modify their Snap protocol from a datagram to a virtual circuit concept, he said.

New protocols like IBM's Systems Network Architecture (SNA) and Digital Equipment Corp.'s Decnet have message-handling features that need a message-type interface and not a virtual call-type interface. Thus far IBM has not taken sides in the battle over datagram or virtual call methods for its SNA, Pouzin said, but has made a concession to Telenet in allowing changes to the Network Control Program macros in the 3705 front end.

This has allowed Telenet to implement a virtual circuit approach. But one drawback of the virtual circuit is that it is not adaptable to short message transaction-oriented environments found in the newer IBM terminals.

If the virtual circuit methods predominate, the user will have to develop packet-transport mechanisms that include error recovery, packet-handling methods and multiplexing among others, Pouzin warned.

The PTTs are competing with each other for multinational network traffic and, if data users insist on datagram access, they will have an easier time operating on the emerging packet-switched nets, Pouzin said. The English and French want packet nets to replace private-line networks, he said.

Lack of Standards Creating 'Monster'

(Continued from Page 17)

The carriers, however, are reluctant to set standards for equipment suppliers, he said. This type of development will have to come from the DP side rather than the communications side.

Telenet has said it will provide a CCITT standard network interface when and if such a standard is finalized, Cotton said.

Middle-level protocols dealing with the user-to-network interface remain the prime candidates for standardization.



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Virtual Terminal Line Controller Has Shared-Resources Capability

PHOENIX – Courier Terminal Systems, Inc. has designed the 2761 Virtual Terminal Line Controller (VTLC) which incorporates virtual terminal addressing and virtual memory.

The VTLC front-end processor introduces shared communications resources in an IBM 360/370 telecommunications environment, the company said.

The 2761 is said to enable an IBM 360 user to have the benefits of a Vtam approach even though his 360 is a nonvirtual system. The 370 user can have a Vtam-type network without the memory constraints of Vtam.

If Vtam is used with the Courier VTLC, a dual-dimensional virtual network is established which eliminates remote communication software and some mainframe functions such as error recovery, Courier said, adding the VTLC's capability to share system resources and establish effective paths of communication provides the user with a virtual communications facility.

In the Courier VTLC environment, application programs communicate with terminals without concern for intermediate connections such as front ends, control units and communications lines.

By sharing VTLC resources, several application programs using Tcam, TSO, CICS, IMS or Vtam can communicate with different terminals on the same multipoint lines. Also, any of the terminals in a VTLC network can communicate with any mainframe application programs.

Communication line use is also shared among application programs and terminals. The terminal operator is effectively isolated from the intricacies of the network architecture, the firm said.

The VTLC supports up to four remote lines operating at speeds of up to 9,600 bit/sec and utilizing asynchronous, bisynchronous and IBM SDLC line disciplines.

Up to 32 intermixed remote, local and stand-alone terminals can be connected by log-on procedures that associate a terminal with a channel address. A line may have numerous terminals with only a subset being used at the discretion of terminal operators and the network supervisor, a Courier spokesman noted.

Using the VTLC's intelligence, control of the network is supplemented with diagnostic capabilities for testing remote lines, capturing data streams at the mainframe as well as at the terminals, analyzing software tables and collecting error statistics. Error recovery is performed by the VTLC, eliminating these procedures in the mainframe software, the firm said.

Also included are capabilities for dynamically changing the network configuration, performing message switching by logical terminal names and broadcasting to logical groups of terminals throughout the network.

In addition, a VTLC can be connected to multiple CPUs, thus expanding the overall virtual communications concept.

A minimum VTLC configuration supporting eight terminals can be purchased for $12,675 or leased for $345/mo on a three-year term. A full VTLC system capable of supporting 32 terminals is priced at $19,650 purchase or $570/mo on a three-year term.

Initial deliveries of the 2761 will begin next month, the firm said from 2202 East University Drive, 85034.

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Computerwoche is published by Computerworld GmbH, with a full editorial and production staff based in Munich, and it will serve the German market with the same editorial excellence that has made *Computerworld* a leading EDP publication in the United States.

The market which *Computerwoche* serves is large and growing. At the end of 1973, there were 11,000 computer systems in Germany, valued at just over $4 billion, and recent market studies indicate that expenditures will be growing rapidly over the next four years. Overall user spending is expected to grow at 14% a year, and areas like terminals and communications equipment and software and services are expected to average growth rates of 25%–30% a year.

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WUDS Releasing Low-Cost CRT For Data Inquiry, In-House T/S

MAHWAH, N.J. – A low-cost, interactive CRT terminal has been added by the Western Union Data Services Co. (WUDS).

Called the Video 100, the terminal can be used for data inquiry and in-house time-sharing applications.

On a one-year lease, the terminal costs $65/mo in a basic arrangement. This includes service support from Termicare, the diagnostic and maintenance service of WUDS.

The terminal has a 12-in. diagonal screen and a 64-character display set. Each character is generated by a 5 by 7 dot matrix. The standard display capacity is 24 lines of 1,920 characters each.

Data is entered at the bottom of the screen. The entire data page scrolls upward teletypewriter-style for each new line, the overflow going off the screen.

An underline cursor homes at the lower left of the screen, and the operator can adjust the brightness of the displayed characters, WUDS said.

Terminal Transactions

Keyboard control of the display is provided by Clear Screen, Carriage Return, Line Feed, Space Bar, Backspace and character correction capability. An audible tone warns the operator of approaching end of line.

Minimum of Instruction

Designed for use with a minimum of instruction, the terminal has a typewriter-type keyboard which contains 59 keys, plus a special upper/lower case shift switch, to permit generation of the full 128-character Ascii set.

While all displayable characters are seen as upper case on the screen, lower case characters may be transmitted to a remote computer, the company noted.

Switches on the left side of the keyboard enable the operator to choose between half- and full-duplex transmission mode and among 11 transmission rates ranging from 75 bit/sec to 19.2 kbit/sec. The terminal operates in asynchronous systems over both the dial-up telephone network and private lines.

The Video 100 contains the EIA standard RS-232C interface and is also available with an external, acoustic-coupled originate-only or originate-answer Bell 103-type modem.

RS-232C Connector

An RS-232C connector at the terminal's rear panel allows interfacing to teleprinters for hard-copy recording of information displayed. The bidirectional extension port may also be used to daisy chain multiple data terminals or to interface a magnetic tape cassette unit for storing large messages.

Available options include a 12-line, 960-character display; answerback capability; and lower case display.

The Video 100 is being offered on a one-year or a 90-day lease. The basic unit costs $65- or $75/mo respectively; with acoustic-coupled originate-only, it can be leased for $75- or $90/mo; with acoustic-coupled originate-answer the price is $80- or $95/mo.

First customer deliveries are scheduled to begin in January, WUDS said from 70 McKee Drive, 07430.

RCA Service Offers Receive-Only Printer

CAMDEN, N.J. – Series AF receive-only teleprinter is available on lease from the RCA Service Co.

The Extel offers five-level Baudot coding (two-speed switchable – 75- or 100 word/min and optional eight-level Ascii coding (two-speed switchable – 100- or 150 word/min).

The teleprinter needs no ribbon because it prints on pressure-sensitive paper that can make up to three copies. An optional ribbon printer is also available.

The teleprinter utilizing pressure-sensitive paper is available at $55/mo including service on a one-year lease and for $58/mo on a 90-day lease.

It is in stock for immediate delivery from RCA Service Co. Technical Services, Building 204-2, Cherry Hill Offices, 08101.

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Bits & Pieces

Comten Dynaprobe-8028 Has Event-Tracing Capability

ROCKVILLE, Md. – The Dynaprobe-8028 data handler from Comten, Inc.'s Performance Evaluation Division is a stand-alone mapping monitor with a 500-nsec event-tracing capability, according to the firm.

The device has 32 probes which can be attached to the registers or any other probe points on the host CPU. It is transparent to the computer on which it is used, Comten said.

The 8028 can gather data on instruction addresses, data set placement on disk and the location of programs in memory, Comten said.

Its built-in, front-end comparator does limit checks so the user can monitor a particular partition or anything else that has an address type of mapping.

The unit is compatible with Comten's other Dynaprobe hardware and software products. Comten offers data reduction software to process the 8028's data on most vendor's mainframes.

The 8028 is faster and less expensive than Comten's minicomputer-based 8000 series models, but cannot provide as many functions, the company said.

The 8028 costs $16,000 and leases from $640/mo depending on lease period. Deliveries will begin next month from the firm at 2 Research Court, 20850.

NMA Weighs Certification

SILVER SPRING, Md. – The National Micrographics Association's (NMA) Technicians Services Committee is mailing out a survey questionnaire and opinion poll to a sampling of its membership to determine whether there is a desire for a technician certification program.

Called "Benefits of a Certification Program," it explains to the member that the committee has been given the task to develop and recommend new NMA services for micrographic production technicians. It also points out the purpose of such a technician certification program.

"We are striving to have top-quality micrographic output produced by highly qualified, well-trained, certified technicians whose expert production work will be more widely recognized and valued" said the committee chairman, Rodd Exelbert.

If the survey results suggest a need, the committee will proceed to establish technician categories that should be recognized and tested, create testing criteria and implement such testing with the cooperation of NMA chapters.

The NMA is at 8728 Colesville Road, 20910.

Statistics Replace Intuition

Monitor Helps Gauge Hardware Needs

By Patrick Ward
Of the CW Staff

CLEVELAND – The lack of built-in performance measurement tools in today's computers compares to "trying to fly a 747 to Europe with only an oil pressure gauge," according to Ralph C. Lantzy, vice-president and manager of systems and DP at the Central National Bank here.

When the typical DP user sees a slowdown in his production rate, his natural reaction "is to order bigger and faster equipment, which is exactly what the vendors want," Lantzy said.

Lantzy feels he has gotten around this problem at his own site by installing a $5,000 Capacity Meter from CRU, a subsidiary of Computer Resources in Cleveland.

The bank's Capacity Meter has four sensors which attach to the CPU or peripheral controllers.

Each sensor provides a direct, speedometer-type readout and an electrocardiogram-like hard copy that charts the time of day across the horizontal and the performance data on a vertical scale from 0 to 100, Lantzy said.

The performance data measures "the amount of power we are actually utilizing as opposed to its potential," Lantzy said. The meter doesn't just measure cycle time; it's that plus peripherals performance and channel utilization as they combine to make up the whole configuration," he said.

Central National has multiprogramming IBM 370/145s, each with .75M bytes of main memory. The machines, running under DOS/VS Release 30, handle on-line transaction work as well as a heavy batch load.

Improved Throughput

The Capacity Meter has been installed for four months, three of them on a test basis. "So far it has revealed excessive use of one of the disk channels," Lantzy said.

"By changing the file structure and blocking factors we have reduced that channel utilization considerably and improved our throughput as a result."

The Central Bank looked at several types of hardware monitors before selecting the Capacity Meter, Lantzy said.

"What we saw was either too expensive or did not provide the extent and type of information we were looking for," he explained.

Lantzy wanted a device, like the Capacity Meter, "that gives information on what's happening at this instant with this job stream right now," as well as a historical record, he said.

One advantage of the Capacity Meter is that CRU offers a software modeling package with it, he added.

"This allows us to input variables to the model and predict the processing impact of increased volume, new production systems being scheduled and so on," he said.

'Good Scheduling Tool'

The speedometer-like direct readout of the Capacity Meter "provides some amusement," but it is also "a good scheduling tool in that it permits us to readily know what the impact of two particular jobs running together at a particular time will be," Lantzy said.

Systems programmers can also correlate the historical record on paper with the shop's job accounting system "to determine what production mix at what time caused extremes in utilization," he said.

The DP staff can use the historical data to find excessive channel utilization, excessive seek times and for fine tuning of the system generally, he said.

"We will be able to make hardware judgment on the basis of statistics, not intuition. It will also help us to spot jobs that either need retooling or rescheduling," he said.

"The saving will be in tangible dollars, not spent on peripherals or additional horsepower we don't need," he said.

Lantzy is already proud of the work his department gets out, however. The shop's two 145s share five 1403 printers. The configuration includes 16 Model 1 and four Model 11 3330 disk drives and 16 3420-equivalent tape drives. The bank also has an IBM 7700 audio response unit.

The on-line workload includes commercial loan systems and a central information file which support a total of 17 IBM 3270 CRTs.

The bank, with $2.3 billion in deposits, has about 2,000 production programs in current use.

It provides processing for about 25 correspondent banks and does payroll for about 350 corporate customers who require about 250,000 payroll checks printed each month.

Mobile Carriages Aim to Free Users From Tight Situations

FT. ATKINSON, Wis. – The mobile storage carriages from Spacesaver Corp. can provide 87% more storage capacity than conventional shelving in the same amount of space, the vendor said.

The mobile carriages were designed to be arranged side by side, with no aisle space in between. To retrieve a particular file, the user either manually or automatically pushes the cabinets apart, gets the file and then moves the cabinets back together again.

An electrical system includes sensors in the floor that automatically disconnect the system so no carriage can be moved while anyone is working in the open space between carriages.

Manual Backup

Should there be a power failure, the Spacesaver carriages can be moved manually with a ratchet, the firm noted.

The nonelectrical, manually operated models have a maximum capacity of 6,000 pounds. However, seven pounds of physical effort can move a ton of material, the vendor said.

The mobile file design provides for security by eliminating space between rows and locking all carriages together, it added.

The electric units cost $60/sq ft of carriage, plus shelving. Manual units cost about $35/ sq ft of carriage.

Spacesaver is at 1450 Jamesville Ave., 53538.



These electrically operated Spacesaver Corp. storage systems separate to leave an aisle when an operator wants to retrieve a tape volume. When that's done, the operator can press a button to bring the carriages side by side again.

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Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

Chicago	**Hyatt Regency O'Hare**	**Oct. 27-28**
San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

San Francisco	**Berkeley Marriott**	**Nov. 10-11**

Data Base Design

Given in association with Leo J. Cohen and Performance Development Corporation, this three-day seminar is a package-independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimum File Organization/Indexing Techniques, File Integration, and much more.

Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300.

Denver	**Denver Hilton**	**Dec. 1-3**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

New York	**Summit Hotel**	**Oct. 22-24**
San Francisco	**Hyatt Regency San Francisco**	**Nov. 12-14**
Chicago	**Hyatt Regency O'Hare**	**Nov. 19-21**

Data Communications Course #1010 – Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

Dallas	**Hilton Inn**	**Nov. 10-11**
Miami	**Marriott Miami Beach**	**Nov. 17-18**

Data Communications Course #1020 – Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Miami	**Holiday Inn Airport Lakes**	**Dec. 1-3**

How to Draft Effective Legal Agreements

This one-day seminar is a complete workshop for non-legal, technical people who may be called upon to draft legal agreements for their company. Also led by Roy Freed, this seminar covers a variety of formal agreements, their structure and the legal factors involved. You'll have all the basic skills necessary to write legal agreements, and you'll be able to spot items that really require the attention of lawyers.

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Bell System



Bell offers a new network for Data.

The Bell System's new Dataphone® Digital Service transmits the language of computers, digital signals. It is specifically designed to make delivery of electronic data faster, more accurate and more economical than ever before.

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This new service can save you money in many ways. Higher speeds, fewer errors, and less downtime all yield greater throughput of data. You also save because line charges for Dataphone Digital Service are generally lower than for analog transmission. And since no modems are needed, you save that expense.

Dataphone Digital Service is available now for two-point or multi-point private line transmission linking cities coast to coast. The System will be expanded to 24 cities this year, and we hope to serve many more metropolitan areas in the near future.

BELL IS DATA



Bell offers new efficiency in verification systems

The Transaction* telephone is a Bell System response to the enormous growth and credit verification and check authorization services. It utilizes Digital Input-Voice Answerback (DIVA) to yield significant savings in time and manpower.

Sequenced instruction lights on this new terminal guide the user step by step. A magnetic stripe card sensor reads information encoded on the ABA Track II found on the back of most bank and credit cards, and the user enters additional data by means of Touch-Tone® buttons. Transmission is via the switched telephone network to Dataphone® 407B interface with the data base. Answerback is by voice through the telephone handset, or by signal lights.

The terminal can also be used as a regular telephone.

For the cardholder, the Transaction telephone means less waiting for an approval. For the merchant, bank or other user, it means greater speed and accuracy. For the data manager, it means cost savings through simpler operation, reduced circuit time and greater efficiency, plus the reliability of equipment built to Bell System standards of dependability.

END-TO-END

Bell offers the Dataspeed® 40 data terminal.

Dataspeed 40 service from the Bell System gives you a visual display unit, a keyboard and a line-at-a-time impact printer all in one integrated design. But since this design consists of separate modules, you can select only the capabilities you need now at each of your installations, and add others later.

The printer offers you speeds at the transmission rate of up to 5.2 lines per second in mono case, and 3.7 lines per second in upper/lower case. Lines are eighty characters wide.

The screen displays 24 lines at a time, and storage can be expanded to 2 or 3 screens of data. A variety of editing features facilitate fast and accurate message preparation.

The terminal was human engineered for maximum operator ease and minimum fatigue and error. The brightness can be adjusted to suit the operator and the location and the tube can be tilted to minimize glare.

Built-in diagnostics and test patterns use the electronics of the set to locate any difficulties.

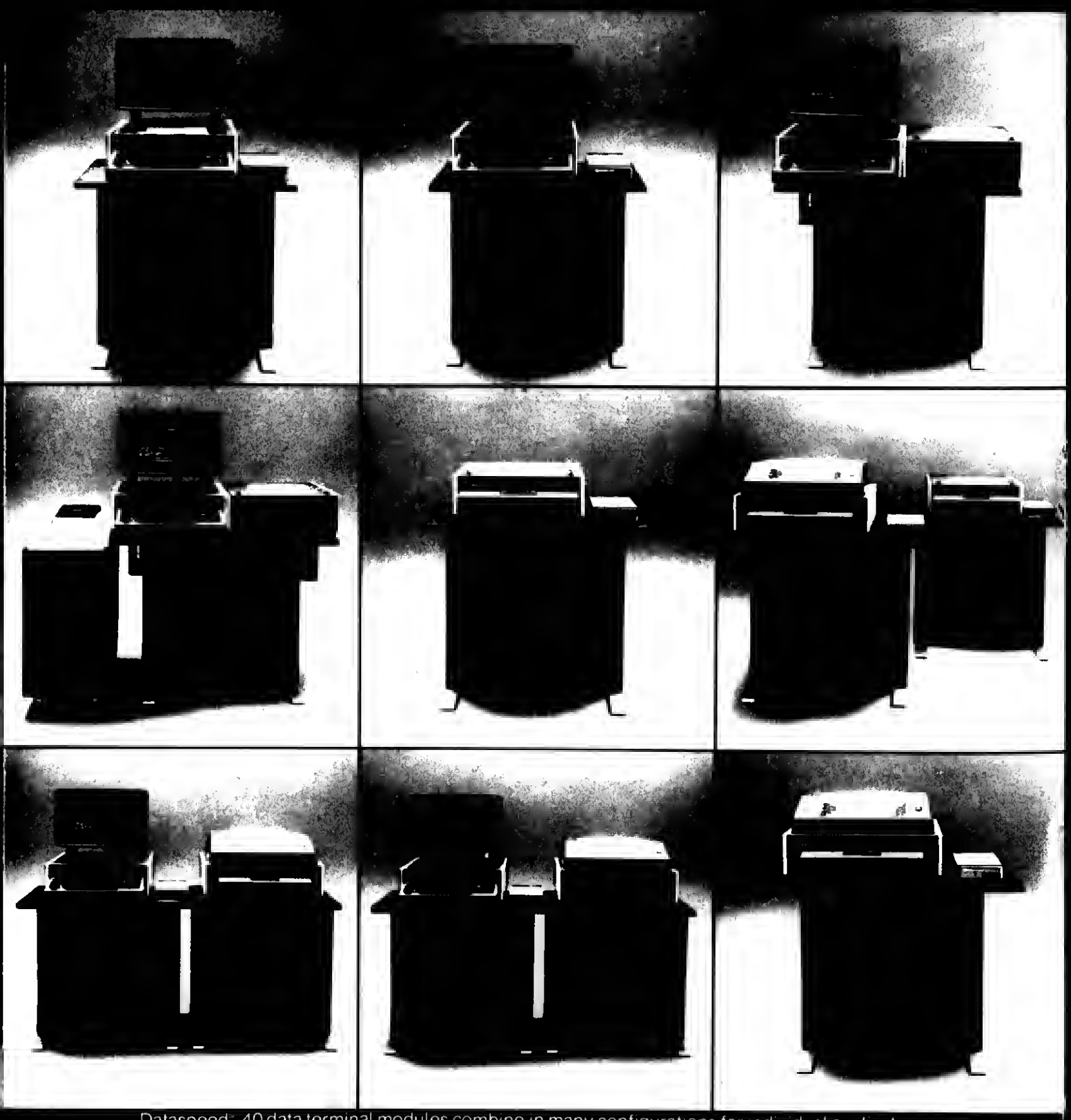
Recent additions to the Dataspeed 40 family include a tractor feed printer, and features which make the terminal more compatible with existing systems designed to support teletypewriters. These features include: destructive scrolling; a switch to select speeds of 30, 105 or 130 cps; a keyboard on-line; and split operation between keyboard/display and printer.

Those are some of the highlights of the Dataspeed 40 story. Ask your Bell Account Representative for complete literature.

Technical Specifications:

Display	5 x 11 viewing area on a 13" display tube High resolution 7 x 9-dot matrix character presentation 127 characters of ASCII code displayed (all except backspace 1,920 character screen capacity composed of 24 lines with 80 characters per line Constant image cursor—when cursor is positioned over a character character becomes a negative image Refresh rate: 60 frames second
Operator Console	Standard keyboard generates 127 ASCII characters Six cursor positioning controls Home, Return, Left, Right, Up and Down Five data editing controls Clear, Character Insert Character Delete Line Insert and Line Delete Basic terminal controls Send, Receive, Local Additional controls for all optional features
Technical Information	Speed Serial Interface 30 105 or 120 cps Method Transmission is serial by bit and character with low order bit transmitted first Synchronization Asynchronous 1 start bit 7 information bits 1 stop bit 1 parity bit Mode half and full duplex Error control Even vertical parity detection on received data Power requirements 117V AC ± 10% 60 Hz

BELL IS



Dataspeed™ 40 data terminal modules combine in many configurations for individual applications

S DATA

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Dataphone 4800 transmits at 4800 bps over basic, unconditioned private line facilities, or over the switched network.

Dataphone 2400 operates at 2400 bps with the same choice of lines.

Dataphone 1800 operates asynchronously at 1800 bps on conditioned private lines.

Dataphone 1200 transmits asynchronously at 1200 bps over the switched network.

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Technical Specifications:

Data Rate	1200	1800	2400	4800	9600
Modulation	FSK	FSK	PSK	PSK	QAM
Operation	ASYNC	ASYNC	SYNC	SYNC	SYNC
Line Requirement	DDD	PL C2	DDD PL	DDD PL	PL
AC Power	117 Volts · 10%, 60 Hz · 5				
Dimensions					
Height	2 2	2 2	4 25	4 25	5 125
Width	5 8	5 8	10 5	16	20 5
Depth	10 8	10 8	14	11 5	13 5
Weight lbs	5 5	4 5	13	20	42

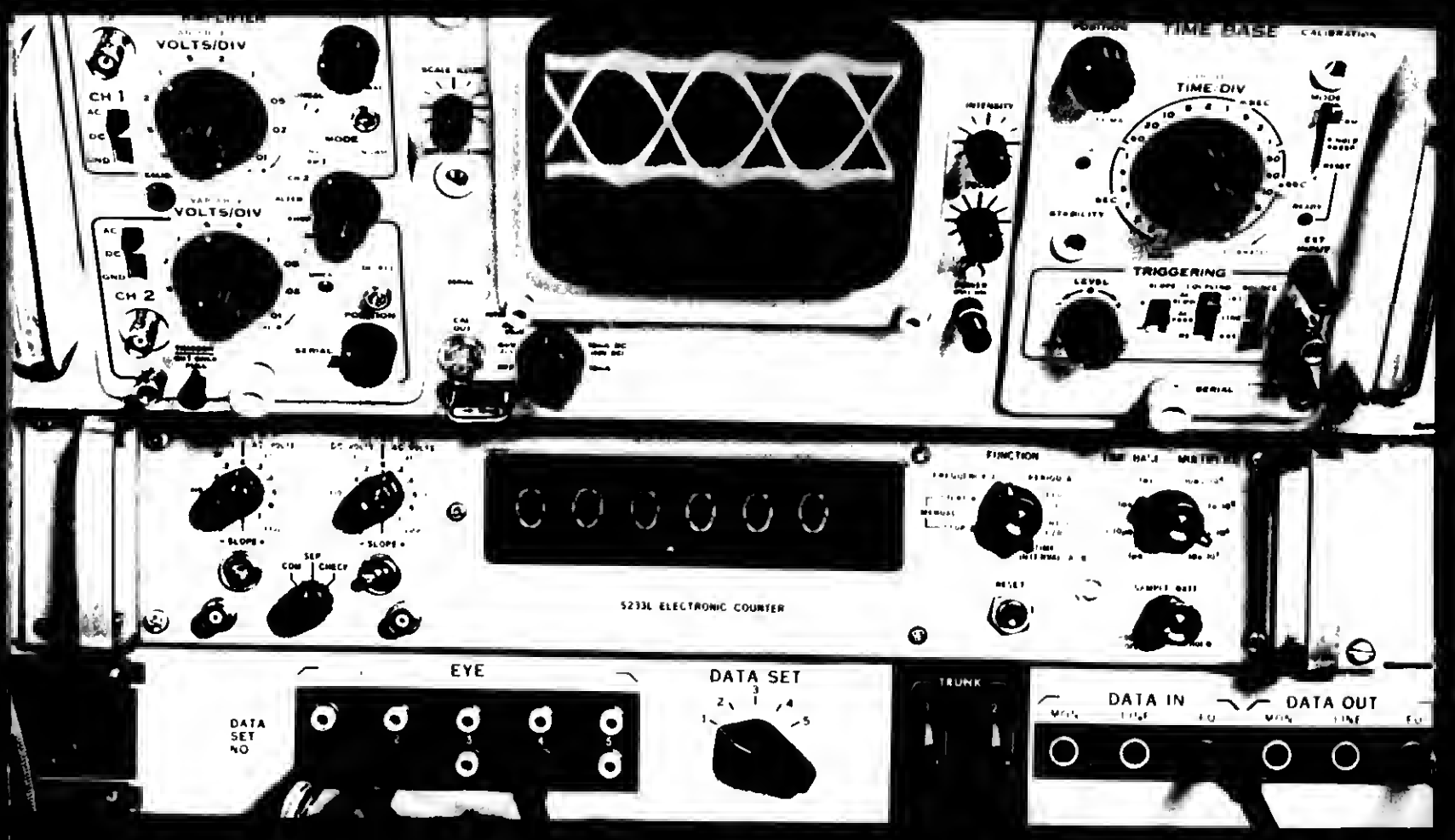
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Who knows more about telecommunications than the telephone company.

Bell System

County System Allocates Investment Funds

PUTNAM COUNTY, Fla. This county is getting the most efficient return from interest-hearing time deposits, using its revenues to produce revenues, by having its computer allocate investment funds.

William Hartley, chief accountant of the county with a population of 44,000 can tell the status of the county's finances as recently as the past 24 hours, and he knows how much money to shift from savings to checking accounts to cover expenses.

"We get daily computer runs on the information we need to make the investments," Hartley said, "so we can keep less ready cash on hand and more on deposit."

The system must work with a $6.5 million operating budget, the county received about $130,000 in interest from investments last year.

Putnam County's success depends on a long chain of financial events, all of which are updated and reported by an NCR Century 101 computer.

The first step is the preparation of the preliminary tax roll required by the state government in Tallahassee for approval by July 1.

Compiled from current rolls for both real estate and personal property taxes and a computation of reassessments, the preliminary roll is a statistical projection of the county's income for the following year.

After the preliminary roll is approved, budgeting begins and, at the same time, the county prepares to send out its tax bills.

"We collect about half our taxes in November, the first month after the bills are sent out," said B.M. Noone, tax collector, "and the rest come in over a six-month period."

Information for the county's money management control is computed and reported through a series of interrelated computer programs.

The Century 101 has been in operation since January, when an NCR Century 100 system used by the county since 1970 was replaced.

The older equipment was expanded as more applications were added, but when the number of programs reached about 200, the necessity for change became evident, according to Lonnie Thompson, county DP manager.

"We were approaching the need for a second shift," Thompson said. "On a day-to-day basis, the computer was running from 7:30 a.m. to 5:00 p.m. – an hour longer than the department was open – and during July and September, which are peak times for tax billing, we were heading for a second shift."

This was at present status, without adding applications, at the time when several departments wanted to increase their use of the DP department, he said.

The new equipment was justified on cost savings alone, but a side benefit to the department was that it released two to three hours a day of computer time for programming and testing new applications.

The upgrade to a 48K processor made faster computing possible, and peripherals were also installed to speed up input and output times. Two NCR 656 disk drives, which will store up to 20 million bytes of information for random recall and processing, were also purchased at the same time.

Most of the county's data files are resident on tape, Thompson noted.

The files are read to disk for computation and printing and the updated file is then read back to tape, so efficient tape drives are necessary.

The county agreed to be the test site for the new NCR 634 tape drives, and installed three units. The handlers doubled the packing density on the tape, from the old system's 800 bit/in. to 1,600 bit/in. In addition, they can be switched back and forth to permit working at either density.

This is particularly advantageous to Thompson because his files were all at 800 bit/in. Now, when a file is read to disk for computation, it is read in at 800 bit/in., but the updated file is read back to tape at 1,600 bit/in.

The tape drives were also installed with the idea of expansion, instead of replacement, of the system. The drives can be modified to double the read speed.

"There's quite a bit of room for expansion just by upgrading the tape handlers and adding NCR 657 disk drives for more capacity," Thompson said.

An NCR 646 train printer completes the installation. The department was working with a drum printer which operated at 450 line/min alphanumerically and at 900 line/min numeric. The current printer is rated at 1,200 line/min.

Time/Cost Savings

The system was installed with the projection that it would boost throughput about 25%.

"We were pleasantly surprised to check the job report and find we'd increased our capacity by almost 40%," Thompson commented.

The savings in personnel costs to the county are also significant. Voter registration is one example. The voter's roll of 17,300 names is filed on tape and updated periodically. Voters are registered by name, sex, race, party preference and precinct and the list now is computer sorted to provide the supervisor of voter registration with up-to-date statistics.

The voter rolls also have other uses. As elections approach, lists are sold to candidates for campaigning, and the entire roll also is used for jury selection.

Thompson's programmers now are working on a traffic management information system for the county courts under a grant from the Government Highway Safety Commission. The system uses daily inputs of traffic citations from the Traffic Bureau and case disposition information from the courts to create a daily calendar of cases coming up within three days, an arraignment docket and a monthly statistical agency report for the state highway patrol, the county sheriff and the city police.

Thompson is also developing a new budget on the data base concept. The budget and the accounts payable system will be merged into one file.

"In the budget we have three primary areas: expenditure accounts, revenue accounts and depository accounts," Thompson said.

"Any transaction that affects an expenditure account could also affect a revenue account and always affects a depository account. So in the new system every expenditure master will have a chaining address to its corresponding revenue account and from there to the corresponding depository account. Instead of updating three files, we will now only update one and the computer will do the rest," he said.

New input devices are also being installed to speed the system even further. One is a group of off-line CRT terminals through which the departments will enter their own data on disk. The unit will edit the data for efficient input to the computer.

Another input device an NCR 275 electronic validating machine has been installed in the tax collector's office. At the same time it validates payments, the machine will also capture the data – account number and the amount of the payment – on tape cassettes.

The data then can be read directly into the computer from the cassette, eliminating the additional step now required.



An operator at the Putnam County, Fla., DP department prepares for a run on the NCR Century 101.

Form-Feed Option On Paper Shredder

NORTHBROOK, Ill. – The Jet-12 desktop paper shredder from Shredmaster Corp. can be ordered with an optional form-feed funnel attachment that allows the unit to automatically feed and shred continuous forms, the vendor said.

The device costs $645 from the firm at 1101 Skokie Blvd., 60062.

AUSTRALIA

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849 851	1316 –	2311 –	23111 854	100	1100	7.25
869 871	2316 –	2314 –	23141 841	100	2200	29.2
873	–	–	23142	200	2200	60.0
876 storage module	–	–	9760	200	6060	40.0
877	–	–	9762	400	6060	80.0
879 881	3336 –	3330 –	33301 844	200	4040	100.0
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CONTROL DATA CORPORATION

Interactive Graphics System Eases Firm's Renovations

By Patrick Ward
Of the CW Staff

ST. PAUL, Minn. – An interactive computer graphics system is helping the 3M Co.'s central engineering department produce architectural drawings in about half the time it would take to do the work manually.

The 3M Co. spends hundreds of thousands of dollars each year on construction and renovation of its own facilities. The graphics system cuts down on the repetitive nature of the necessary architectural drawings and provides quality superior to that of copiers, according to H.W. Reimer, a senior designer.

Beyond that, the system's stored memory lets it automatically draw items like light fixtures across a floor plan at the operator's order, he said.

The same capacity to call up previous data from memory allows the designer to check for interference between various elements in a floor plan long before actual construction starts, Reimer said.

The Computervision graphics system includes one Interact II Large Interactive Surface (LIS), an interactive plotter/digitizer terminal; an interactive graphics CRT display; a minicomputer with 4K memory, 256K-word disk memory and cassette tape unit; and Computervision's Cadds I graphics operating system software.

Multilayer Set of Drawings

The process begins when an architectural floor plan is developed to the specifications of one of 3M's manufacturing divisions. It is then input to the Computervision system by digitizing on the Interact LIS.

This building outline drawing, called the "background drawing," is the first layer of what will become a multilayer set of drawings of the building, each layer being a floor plan for a specific function such as lighting, power, heating, ventilation, air conditioning, plumbing structure and major equipment placement.

To produce one of the layers of the drawing – the electrical system layout, for example – a ball-point pen plot of the background layer is provided for the electrical system engineer assigned to the building. He sketches his electrical layout on this drawing.

Depending on the nature of the job and the preference of the engineer, this freehand layout may be fairly detailed or it might be very rough. The electrical system engineer then returns this marked-up drawing for input to the computer graphics system.

Using a library of industry standard electrical symbols and subfigures commonly used at 3M, the designer at the interactive terminal enters the layout into the graphics data base of the system. The designer can work at either the LIS plotter/digitizer or at the CRT.

When the designer is satisfied with the new drawing, he obtains a pen plot showing all the information he has entered and returns it to the originator for checking. When the drawing gets final approval, a finished-quality ink plot is made.

In similar fashion, a set of floor plans for all functions is built up in significantly less time than would be required using manual methods. At the same time, a computerized graphics data base for each drawing is stored in the computer for later output or update.

Zeta Off-Line Plotter Includes DEC PDP-11

LAFAYETTE, Calif. – The 6000 series intelligent off-line plotting system from Zeta Research includes a Digital Equipment Corp. PDP-11 that can be used for applications outside the system.

Consisting of a magnetic tape drive, the PDP-11 and a 36-in. drum plotter, the 6000 series features a speed selector for optimum speed/quality output, Zeta said.

The plotter operates at speeds up to 4,000 increment/sec (14.4 in./sec). Increment size is .025 in. A .002-in. increment size is optional.

System controls are mounted on the front of the computer and include the following functions: START (plots, unattended, from 1 to 159 plot files): PAUSE; NEXT PLOT (stops plot at any point, advances to clean paper and begins next plot); SELECT SWITCHES; STORE; and MULTIPLE (which executes any number of multiple plots up to 159).

Other functions include SEARCH/RESET (searches, locates and plots desired file, then resets); SPEED (selects maximum speed for highest line quality); and ERASE (erases from memory the previous file which was selected and stored).

The plotting system costs $37,500 from the firm at 1043 Stuart St., 94549.

CAM-I Sets Two-Day Meet In St. Louis in January

ST. LOUIS – Computer Aided Manufacturing-International, Inc. (CAM-I) will hold a two-day coding, classification and group technology seminar here in mid-January.

Users and vendors will describe applications, problems and results. An on-line computer demonstration is planned for all seminar attendees of the CAM-I Machined Parts Process Planning Creator Module.

The cost will be $25 for CAM-I members and $250 for nonmembers.

Further details are available from C.H. Link, executive secretary and general manager of CAM-I, at Suite 1107, 611 Ryan Plaza Drive, Arlington, Texas 76012.

Syncom Box Holds Floppies

ORCHARD PARK, N.Y. – The Flexi-Disk security files from Syncom, Inc. are all-steel boxes with carrying handles and nonskid, nonscratching bases, according to the vendor.

Friction strips inside the boxes prevent floppy disks from slipping whether the boxes are full or nearly empty, the vendor said.

The FS-100 security box holds up to 100 floppies and costs $85; the FS-60 version holds up to 60 disks and costs $75.

Syncom is also offering two 20-in. mobile carts. One holds two floppy disk boxes and costs $74; a single-box cart costs $59.50.

Syncom is at 1 Syncom Place, 14127.



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Mini Bits

Ampex 300M-Byte Disk Drive For OEMs, Systems Houses

REDWOOD CITY, Calif. – Ampex Corp. has announced a 300M-byte removable disk drive it will begin shipping to systems houses and OEMs early next year.

Called the DM-9300, the product is primarily intended for large minicomputer systems, an Ampex spokesman said.

Ampex achieved the 300M byte/spindle capacity by increasing the linear bit density of its 200M-byte drive from about 4,000 bit/in. to around 6,000 bit/in., a spokesman said.

The DM-9300 retains about the same number of tracks as an IBM 3330, he noted, but its data rate will increase from the 3330's 806 kbyte/sec to about 1.2M byte/sec.

Ampex's 100M-byte and 200M-byte drives are field upgradable to a DM-9300. The DM-9300 will also retain compatibility with IBM's 3336 Model 2 pack, the spokesman added.

The drive will cost about $14,500 in OEM quantities from Ampex at 401 Broadway, 94063.

Interdata Models Get Memory

FORT LAUDERDALE, Fla. – A plug-compatible core memory module for Interdata models 7/16, 7/32, 8/32, 50, 55, 70 and 74 minicomputers has been announced by Standard Memories, Inc.

Designated the 116K16MM, the module has storage capacity of 16K 16-bit words and is identical in form, fit and function to core memory offered by the mainframe manufacturer, Standard Memories said.

The 116K16MM offers access time of 275 nsec maximum. Memory cycle time is .75 μsec for the model 8/32 and 1 μsec for the 7/16 Basic, 55, 70 and 74 models.

The 7/16 HSALU and the 7/32 may have either .75 μsec or 1 μsec cycle time at the option of the CPU.

Two basic versions of the module – with and without parity – are offered. All other memory configuration requirements are accomplished with five push-on clips which fit over wire-wrap posts.

The module costs $2,100 from the firm at 2801 E. Oakland Park Blvd., Suite 307, 33306.

Crown Has Movable DP Offices

BRISTOL, Conn. – The movable DP offices from Crown, Inc. are intended for construction sites, manufacturing plants, truck depots and other places where a user might want to have a small computer system, but lacks the office space.

The offices, most of which are movable by forklift truck, come in a variety of sizes. They are delivered fully assembled, and the user has only to tie the prewired panel box into an adequate power source, Crown said.

A 10 ft by 16 ft movable building with carpeting, heating, paneling, lights and electrical supplies costs about $2,800 from the firm at 179 Cross St., 06010.

LSI I/O Circuit Cuts Floppy Costs

ANAHEIM, Calif. – Rockwell International Corp. has introduced a large-scale integration (LSI) floppy disk controller I/O circuit as part of its PPS-8 microprocessor system.

With the unit, the firm claimed costs of IBM-compatible disk controllers can be cut by as much as 80%.

Prices are $125 each for quantities of one to 24, $100 for quantities of 25 to 99 and $80 for quantities of 100 to 199 from the firm at 3310 Miraloma Ave., 92803.

Programs Rated Low

Mini Hardware Scores High in Survey

By E. Drake Lundell Jr.
Of the CW Staff

DELRAN, N.J. – Minicomputer users are generally pleased with their hardware and mini operating systems, but are less pleased with available applications programs and technical support that is available, according to a user survey.

The survey, conducted by Datapro Research Corp. here, found users rated the reliability of their mainframes as the high point for minicomputers, followed by ease of operation, reliability of peripherals, manufacturers' operating systems, ease of programming and responsiveness of maintenance service.

Receiving lower ratings from the 699-user survey (each with an average of 3.12 mini systems installed) were the technical support available, the applications programs from the mainframe vendors, the ease of conversion and the effectiveness of maintenance service.

This is because, "despite claims to the contrary, programming for minicomputers is no easier than programming for the larger, general-purpose DP systems," Datapro said.

"In fact, the minicomputers' short word lengths, limited storage capacities and lack of sophisticated software aids tend to make the programmers' job even more difficult," the firm added.

"As a result, it is common in minicomputer applications for programming costs to far exceed the cost of the hardware itself," Datapro said.

Programs Written In-House

Probably because of the lack of applications programs from the vendors, the study found 84% of the users surveyed used in-house personnel to write at least some of their programs.

Of the respondents, 14% used computer manufacturers personnel for some program development; 21% used some "ready-made" programs from the mini maker; 12% used proprietary packages; and 12% used contract programming houses for some program development work.

The figures add up to more than 100% because many users rely on more than one source for program development, Datapro noted.

In the survey, 59% of the users reported they used their systems for business DP. Data communications applications were next in line, with 24% of the users reporting such applications.

Following those applications in popularity were scientific/engineering calculations, with 19% of the users reporting some such uses; real-time control, with 19% of the respondents; and data base management, which 11% of the users reported running on their mini systems.

Again, the figures add up to over 100% because many of the users have multiple applications for mini systems.

Terminals Used by Half

Over half of the users in the survey were using terminals with their mini systems, with 91 of the 699 using batch terminals and over 300 using interactive terminals.

The independent peripherals manufacturers seemed to be fairly well entrenched with the minicomputer users with over 34% reporting the use of independent disk drives; 20% reporting installations with independent tape equipment; 9% reporting independent main memory; and 17% claiming the use of "other" types of independent peripheral equipment.

The report, which contains a listing of the key functional characteristics of 189 commercially available minicomputers from 54 separate manufacturers, is available for $10 from the firm at 1805 Underwood Blvd., 08075.

DG Nova 3 Series for OEMs Uses In-House Semiconductor Memory

SOUTHBORO, Mass. – Data General Corp. (DG) has expanded its line of OEM minis with the introduction of the Nova 3 series of machines that range in size from 4K to 128K and in price from $2,600 to $34,200 in typical configurations.

At the same time, the firm announced it is moving further along the line of vertical integration by offering Data General-manufactured semiconductor memories for the systems.

The four-slot Nova 3/4 and the 12-slot Nova 3/12 – the first members of the series – are available with core memory in 8K and 16K increments or with the Data General-produced MOS semiconductor memory in 4K, 8K or 16K increments.

The systems are said to be compatible with the firm's Nova-line software and with all Data General peripherals.

Software includes the firm's real-time operating system (RTOS) and real-time disk operating system (RDOS) along with the firm's currently offered programming languages.

The Nova 3 line will compete with computers like the Hewlett-Packard 21MX, Digital Equipment Corp.'s PDP-11/03, 11/04, 11/35 and in some cases the LSI-11, according to a company spokesman.

Besides the memory expansion capability up to 128K, the units feature a data channel map capability, high-speed direct memory access channel and 16-level priority-interrupt structure, and a choice of operator's console or turnkey front panel, the firm said.

Memory Speeds

Memory cycle speeds are 700 nsec for MOS memory, 800 nsec for 8K core memory and 1,000 nsec for 16K core. Core and semiconductor memories can be mixed in any combination in a single system, the firm noted.

The semiconductor memory consists of N-channel 4K MOS random access memory (RAM), which the firm is manufacturing at its plant in Sunnyvale, Calif.

An alternate memory board will be available using MOS parts supplied by Texas Instruments (TI). Data General said it expected a substantial number of semiconductor memories to be shipped with the TI parts.

Nova 3 semiconductor memories will be offered with an optional battery backup power supply, the firm added.

The low-end price for a Nova 3/4 with programmer console and 4K of MOS memory is $2,600, while a Nova 3/12 unit with console, parity and 32K MOS will sell for $10,800.

A full-blown system with 64K of core and 64K of MOS memory, console, expansion chassis, hardware multiply/divide, memory management unit, automatic program load and power fail/automatic restart will go for $34,200, the firm said.

Prices are discountable according to the firm's normal OEM schedule, and deliveries will begin in January, the firm added.

The firm also pointed out that, used with the firm's DCU/50 data control unit and synchronous and asynchronous multiplexers, a Nova 3/12 could handle medium- and high-speed data transmission lines.

CA Adds Floppy-Based Systems

IRVINE, Calif. – A group of floppy disk operating systems has been announced by Computer Automation's (CA) Naked Mini Division to accelerate the process of preparing applications programs.

Using essentially the same software as CA's paper tape disk operating system, these batch processing floppy disk operating systems allow command inputs from a keyboard or from job files containing job control language statements, CA said.

The operator can load the disk with a string of jobs, start up the system and then walk away. The operator does not have to sit at the machine and interact with the system, the vendor said.

Each machine contains an Alpha LSI-2 series minicomputer, a core memory with a capacity of 16K or 32K words, a dual floppy disk subsystem, a Teletype ASR-33 and an operating system package that includes an executive, an input/output control system, a disk file manager, an assembler and a macro assembler.

Utility Subroutines

The operating system Executive with its resident utility subroutines supports such program debugging and maintenance functions as file-to-file viewing/copying, character-oriented text editing, line-oriented source program editing, linking/editing object programs and alphabetizing/listing cross-references of program symbols, according to CA.

Each floppy disk operating system includes basic variables, Teletype interface, auto load, real-time clock, power fail restart and EIA RS-232 interface options as standard elements. All 32K systems include a Fortran IV package that supports the full Ansi Fortran X3.9-1966 language plus extensions, the firm said.

The advent of floppy disk drives led to the development of small programming systems without the need for large cartridge disk drives and paper tape equipment, according to Emmons Miles, general manager of the division.

Floppy disk drives give operating systems nearly the capabilities of cartridge disk drives and paper tape equipment at less cost, he said.

Although floppies operate at a lower rate of speed than cartridge disks, floppy disk operating speed usually does not degrade the rate of program processing, he added, noting that since one-quarter of a megabyte of storage can maintain a fairly large library, the floppy can store an adequate number of programs.

"These advantages make floppy disk operating system a very attractive system for getting more productivity out of programmers and they don't have to sit knee deep in paper tape during program development," Miles said.

Model prices range from $13,975 to $35,550. Delivery is 30 days from the firm at 18651 Von Karman.

Also Prove Cost-Effective

Dedicated Minis Make Space Probes More Reliable

By William C. Frey
Special to Computerworld

PASADENA, Calif. – In processing data received from the National Aeronautics and Space Administration (Nasa) Deep Space Network at the Nasa/Jet Propulsion Laboratories' (JPL) Network Operations Control Center (NOCC) here, we are realizing more reliable results than previously with our large-scale computer – with improved cost-effectiveness – with a series of functionally dedicated minicomputers.

Separation of function by minicomputer holds the key. Each minicomputer performs its own dedicated task in a distributed processing network and the network of processors contains an on-line spare minicomputer, so that in the event of prime computer failure, software swapping can be performed to continue the function on the backup computer. Thus a minimum amount of system disruption occurs when a processor goes down.

The distributed processing approach to the network data processing area of NOCC is a significant departure from the prior situation, in which all network data processing resided in a single large-scale computer shared with the Nasa/JPL flight project and mission control software.

NOCC performs all the Deep Space Network data handling and processing functions for such missions as Ranger, Pioneer, Mariner and Helios. The Deep Space Network consists of a series of 10 ground tracking stations strategically located around the world for continuous tracking of space probes.

Data acquired by the 10 ground stations is transmitted by high-speed communication links to the JPL control center over 4,800 bit/sec and 50 kbit/sec communication lines.

Software Tasks

The network data processing software tasks include: monitoring and validation of data from the Deep Space Network tracking stations, logging on magnetic tape all incoming data and remotely controlling the configuration of the Deep Space Stations.

As traffic in what we call deep space (lunar distances and beyond) picked up in 1972, it became apparent general-purpose, large-scale computers simply could not give us the software flexibility and responsiveness for both flight project and mission control and network data processing operations.

We couldn't tailor or expand the software specifically for our needs because of the impact of other users of the large-scale system.

The answer lay in separating the flight project and mission control processing from the network data processing functions associated with the JPL/Nasa Deep Space Network.

At this writing, we are in the final stages of a three-phase conversion from the large-scale, general-purpose approach toward a separate facility for network control data processing, which will include 19 minicomputers, all Modcomp II units provided by Modular Computer Systems.

The three-phase conversion is designed to carry the NOCC functions from a point of full reliance on a large-scale computer to an independent minicomputer network with capabilities for DP and remote control of the 100 Deep Space tracking stations around the world.

Phase I used a single minicomputer for switching and routing of communication acquired from the tracking stations. In addition, a medium-scale computer was introduced for a limited amount of communications processing, signal validation and off-line analysis of communication network performance.

Phase II has been implemented at this writing. It involved setting up seven Modcomp II minis to implement dedicated functional processing.

Two of these minis serve as communications switchers, operating in full redundancy for continuing backup. Four of the Modcomp units are dedicated to the data stream functions of the mission: telemetry, tracking, command and monitoring. The final Modcomp system can be introduced for backup in case of failure of any of the four functionally dedicated units.

Each of the Phase II minis has 64K (16-bit) of main memory and 5 million bytes of disk storage. Each has a console printer and drives a color video status display with keyboard-entry capabilities.

Data routing within this minicomputer network is through what we call a star switch controller, a hardware assembly designed and built at JPL. This controller forms the necessary data links between the front-end communication processors and the functionally dedicated computers.

Functional Breakdown

The functional breakdown of the network processors is at the heart of the reliability and throughput we have realized. JPL people have designed and written application programs specifically for each of the data streams.

Data covering the four network functions – telemetry, tracking, command and monitoring – are intermixed in streams which move between the ground stations and NOCC. Evaluation and validation of data in each of the four streams must reflect different criteria.

In Phase III, a full complement of 19 Modcomp II minicomputers will be utilized to perform the network operations control function. More sophistication in the processing and validation of the Deep Space Network data will be introduced.

This, simply, is why it has worked well to have functionally dedicated hardware and software for processing of network data. Files within each of the functional minis contain data projecting conditions expected throughout the course of a mission. The data on anticipated results is compared continuously with the actual readings.

Frey is group supervisor for network control systems at JPL.

Getting your data from here to there

A special supplement on Data Communications Network Configurations in the November 26th issue of Computerworld.

You can run into a lot of hangups planning and operating a data communications network. Your DP staff - including managers and technical specialists - has to make important decisions on a lot of expensive items like terminals, line speeds, modems and network configurations, to name a few. These networks are usually planned years in advance, and when they are put together, they're built to last. Yet the industry is in a constant state of change, and networks are often being upgraded with faster equipment, newer sites, more efficient lines, etc. So proper planning is essential.

We'll be taking an in-depth look at the changing world of data communications networks in the November 26th issue of *Computerworld*. And we'll give special emphasis to how they should be planned. Edited by Ron Frank, this supplement will be filled with input from users who understand this environment with all its implications, and you'll get the benefit of their experiences. You'll see stories that evaluate common uses of data communications, like batch versus on-line, private lines versus dial-up lines, all-digital versus analog lines, and the use of newly emerging carriers. And you'll see stories that point out ways you can get the least cost on your configurations.

If you're involved with data communications - or if you will be in the future - you should be reading this special supplement in the November 26th issue of *Computerworld*. And if you're marketing data communications products or services, you should advertise them here. But don't miss the November 7th ad closing date. Contact your area *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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COMPUTER INDUSTRY

CI Notes

Univac Ends Xerox Talks

BLUE BELL, Pa. – Univac has discontinued negotiations to purchase Xerox Corp.'s Data Systems Division's customer base.

Univac said no agreement could be reached on "price, terms or conditions."

This leaves Honeywell, which has expressed interest in the Xerox user base but not the firm's manufacturing facilities or other assets, as the principal contender in negotiations.

At the same time, Xerox laid off 580 more employees, bringing to 1,200 the number idled as a result of the firm's decision to leave the mainframe business.

When that decision was announced last July, the Data Systems Division employed 4,100 throughout the U.S.

A Xerox spokesman refused to say where the new cuts were made, but sources indicated several hundred were production employees.

As for its backlog, the Xerox spokesman did say "we are working away at it," but refused to connect getting on top of its current orders for mainframes, add-on equipment and spare parts with the most recent pink slips.

Bill to Beef Up Trust Busters Awaiting Ford's Signature

WASHINGTON, D.C. – A bill that would strengthen the antitrust enforcement staff of the Justice Department has been approved by a House-Senate Conference Committee and is on President Ford's desk for signature.

The bill – H.R. 8121 – is the first ever passed that provides an appropriation for a specific division of a federal agency, a Senate Judiciary Committee staff member said.

The President has until Oct. 21 to sign the measure that would raise the antitrust division's appropriation for the current fiscal year to $21.6 million.

Controversial measures proposed to revamp the Sherman Antitrust Act, the Clayton Act, the Civil Process Act and the Federal Trade Commission Act and thus provide for more effective antitrust enforcement are due for consideration by the end of October.

MPI Sells Calif. Memory Plant

MINNEAPOLIS – Magnetic Peripherals, Inc. (MPI) has sold its computer memory products plant in Hawthorne, Calif., to Northrop Corp. for an undisclosed amount of cash.

Design and production of flexible disk drives and cartridge disk drives will be transferred to other MPI facilities in Oklahoma, South Dakota and Minnesota over the next seven months, the firm said.

The Hawthorne plant, which currently employs approximately 800 people, will phase out production staff gradually to assure continuity of customer shipments.

Prime Awards Discount to Educom

FRAMINGHAM, Mass. – Prime Computer, Inc. has signed a letter of agreement with the Interuniversity Communications Council, Inc. (Educom) offering discounts on all hardware and software products on the company's standard price list as well as on services.

A consortium of more than 200 colleges, universities and nonprofit organizations, Educom was founded to help its members make the most effective use of computer and communications technology.

Under the agreement, Prime will make sales, delivery, installation and service arrangements with each Educom purchaser directly.

But Nature of Industry Changing

DP Sales Seen Topping $25 Billion in '75

By Catherine Arnst
Of the CW Staff

HOT SPRINGS, Va. – With revenues that should top $25 billion this year, the computer industry is "alive and well," Jim Peacock, editor of *EDP Industry Report* (EDP/IR), told the Computer Industry Association's (CIA) annual meeting here recently.

At the same time Peacock shared some new EDP/IR growth figures with the 40 executives who attended, he warned the "very nature of the industry is changing," and independents should be prepared for it.

Peacock predicted general-purpose terminals will be joined by more than one million "information appliances" including such things as point-of-sale terminals, various banking terminals, stock market quotation/trading terminals, special ticketing or betting terminals and electronic funds transfer devices which will be installed by 1980.

The number of data entry/data communications keyboards in the U.S. will hit the 950,000 mark this year and will top 1.5 million by the end of 1979, Peacock said.

The independent computer peripherals business will multiply its 1974 volume 2.8 times to about $6.4 billion in 1979, he predicted, and computer services will expand two and one half times to the $6.6 billion level.

Minicomputer shipments, which exceeded $1 billion in 1974, should grow three times by 1979 and reach the $3.4 billion mark, he said.

Changes in the Wind

As for changes, the first will be the "way we define and describe computers and, for that matter, in the way we go about counting them as well," he said.

"The architecture of computer systems will continue to move away from the classical combination of processor, memory, some control circuitry and an input and output module. The computer will become a network oriented around a vast memory hierarchy."

The "drastic reductions" predicted in product prices may not actually occur, Peacock said.

"The price drop in the hardware portion of computer systems will be offset by a combination of inflation and an increased rise in the cost of software and support services," he explained.

Users are shifting gradually from rental to purchase of systems. Less than half, in dollar value, of the IBM 370s in use in the U.S. are owned by IBM, and the figure is even lower for older gear and for other mainframe manufacturers, Peacock said.

This is important, he said, because users will be looking for alternate upgrade paths and manufacturers will offer them.

IBM is already shifting its emphasis away from rental, he added. The 5100, for example, is a purchase-only machine.

"It's becoming clear IBM's General Systems Division represents a new voice in the computer industry that we had better be listening to," he said. "Perhaps it is getting set to voluntarily cut off from IBM; it would be about the third or fourth largest computer company if it were cut off, and in a year or so would be the second largest."

This group represents some of the trends worth watching for from the hardware standpoint, he emphasized.

Demise of Programmer

"The gradual demise of the programmer as we see him today" was another change Peacock predicted. Systems experts in user organizations will be more like management specialists, or information specialists, than they will be programmers per se," he said.

"Boundaries in the supply of computation or information processing are getting hazy," he continued. "Service bureaus find themselves competing with small business computers, for instance, and systems houses play both sides of the line."

Smart terminals, information appliances, word processing and so forth bring more suppliers into the act, all offering alternative solutions, he added.

The key word for the future is "marketing," Peacock said. "The technology has a way to go, but it will get there no matter what we do. This industry is supersaturated with technologists, yet it is marketing that opens up the new vistas," he said.

CW at CIA

Standards Take Time: Davis

By a CW Staff Writer

HOT SPRINGS, Va. – There are so many checks and balances in standards making that if an agreement on an interface standard was reached today, it would take 24 months to get it on the books, Dr. Ruth Davis, director of the National Bureau of Standards' (NBS) Institute of Computer Sciences and Technology, told the Computer Industry Association's (CIA) annual conference here recently.

These checks and balances compel the bureau to set up committees and work with 205 government people in the Federal Information Processing Standards Coordinating and Advisory Group, for example.

The checks also oblige NBS to publish notices in the *Federal Register* so individuals in the private sector can comment. After the comments are received, the NBS must "rewrite our answers to the comments in the *Federal Register*, allow a 30-day moratorium, and so forth," she said.

Davis admitted the standards that have been implemented to date represent a "mixed bag," but "in order to set our requirements, we have to decide where our priorities are in the Bureau of Standards, because we never have enough resources to go around.

"We allocate our resources under conditions of scarcity," she explained.

Types Conflict

There is a conflict between the types of standards desired by users in the Federal government and those in industry, she said.

Users request standards in the areas of software, software documentation, software development and program-

(Continued on Page 41)

IMC Gets Two-Year Export Ban For Violating Trade Regulations

WASHINGTON, D.C. – Information Magnetics Corp. (IMC) of Goleta, Calif., and its British subsidiary, Information Magnetics Ltd., have been denied export privileges for two years for violating U.S. export regulations during 1972 and 1973, the U.S. Commerce Department said here.

The department's Office of Export Administration (OEA) charged the firm with exporting more than $800,000 worth of U.S.-manufactured disk heads and related equipment for electronic computers to Eastern European countries without the required export licenses.

In addition, after the unauthorized exports had been discovered and after assurances from the company that it would observe the export regulations, the U.S. firm directed the British subsidiary in March 1974 to deliver disk heads and subassemblies valued at $108,000 to the Bulgarian Legation in London without the required U.S. or UK export control authorizations, the OEA said.

Further, in October 1974, the U.S. firm exported or caused to have exported to Poland a ferrite slicing machine and a ferrite dicing machine, valued at about $31,000, without obtaining final OEA approval.

IMC neither admitted nor denied the charges.

All outstanding validated licenses in which IMC or its subsidiary have an interest have been canceled, the Commerce Department said, warning no person may trade in goods or technical data exported or ready to be exported from the U.S. with persons or firms he knows have been restricted from dealing in U.S. exports.

The ruling provides for reinstatement of export privileges on a probationary basis after Dec. 2, 1976.

CDC Makes China, Soviet Sales

MINNEAPOLIS – Control Data Corp. has received orders totaling about $15 million from the Soviet Union and the Peoples' Republic of China for Cyber systems, the firm said.

The Soviets ordered a Cyber 76 with extensive peripherals and services for its Hydrometeorological Center in Moscow. The $10 million system will become part of the world weather network.

The Chinese ordered two smaller Cyber 172s, valued at nearly $5 million, for use in seismic data reduction in connection with oil exploration, a CDC spokesman said.

Applications for export licenses are pending with the U.S. Commerce Department. If the Department of Defense approves, the application will go to Cocom, an organization of North Atlantic Treaty Organizations members, for its okay.

Univac was granted an export license in June for a $10 million 1106-II multiprocessor reservations system ordered by the Russian airline Aeroflot.

In July, IBM received an export license for a 370/158, 11 System 7s and related peripherals ordered by the Soviet Union's Kama River truck foundry. That order was also valued at about $10 million.

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Interface for Drives on Way

ISS Plans to Increase OEM Penetration

By Molly Upton
Of the CW Staff

CUPERTINO, Calif. – ISS plans to increase its penetration in the OEM disk drive marketplace, including Europe, according to Everett Bahre, vice-president and general manager.

The firm intends to provide an OEM interface for its family of drives, Bahre said.

"We will have a much more aggressive approach in the non-Univac" market, he said. ISS product lines break down into Univac-compatible, IBM-compatible and OEM, most of which is for minicomputers.

Parent company Univac accounts for less than half of ISS' business; a little more than half of the non-Univac market is composed of leasing companies, with the remainder OEM, he said.

As a further indication of future plans, Bahre said ISS "is committed" to the mass storage area, such as the IBM 3850.

Currently most of ISS business is in the 100M- to 200M-byte range, although its line extends down to the Model 714, a 29M-byte drive, he said.



Everett Bahre

The demand for 100- and 200M-byte drives is expanding and Bahre said he can see a demand for larger capacity drives coming sooner than would have been expected.

ISS "plans to stay competitive in the market" for units above 200M bytes, he said.



CW Photos by M. Upton

Maurice H. Henchey

The recent IBM announcement of the 3350 fixed disk, for which IBM drastically lowered the cost/byte of storage, should make it increasingly difficult for the competition to remain competitive and to put money into future development, Bahre said.

There is an increasing trend among new business toward the double-density products, he said.

As part of the Univac family, ISS will build a floppy disk drive for Univac, Bahre said, adding the product would also have OEM potential.

ISS also makes 36M- and 72M-byte drives for use in the Univac 90/30 family. The firm will be "analyzing the OEM potential" of this product, he added.

ISS, which was the first independent to announce a 3330-type drive, stresses the complete subsystem capability, including controllers, Maurice H. Henchey, director of marketing, said.

The firm has a 100M-byte unit, the Model 7330-11, that is field-upgradeable to 200M bytes. One controller can handle drives of both 100M and 200M bytes on the same string, he said.

GA Shake-Up Reportedly Continuing As Four Outside Directors Resign

ANAHEIM, Calif. – General Automation, Inc. (GA), has announced the resignation of its four outside directors and replaced them with three others.

No one at GA could be reached for comment, but sources said the move is part of a management shake-up that started with the resignations last summer of Raymond J. Noorda as president and Michael A. Ford as vice-president.

Those who resigned are Phillip Greer, Louis B. Lundborg, Coleman W. Morton and Henry E. North.

Replacing them are Walter P. Burker, a former director of McDonnell Douglas Corp.; Henry Ugarte, a director and vice-president of finance for Hi-Shear Corp.; and Rep. John C. Conlan (R-Ariz.).

The fourth outside board seat will remain vacant.

In announcing the new appointments, Lawrence A. Goshorn, GA president, chairman and founder, said "these changes are an integral part of the new leadership of the company," which is "committed to restore profitability this fiscal year . . . and to changes necessary to continue strengthening the company."

Other Moves

■ Amdahl Corp. has appointed Harold O. Shattuck vice-president of engineering.

■ Walter A. Collymore has been named a vice-president of Control Data Corp., with responsibility for product development of the company's data services network.

Executive Corner

■ Thomas M. Walker has been appointed a vice-president of the Systems Division of Computer Sciences Corp. and the director of the Information Sciences Center in Virginia.

■ Robert V. Henry has been appointed vice-president of engineering and advanced development of printer products at Dataproducts Corp.

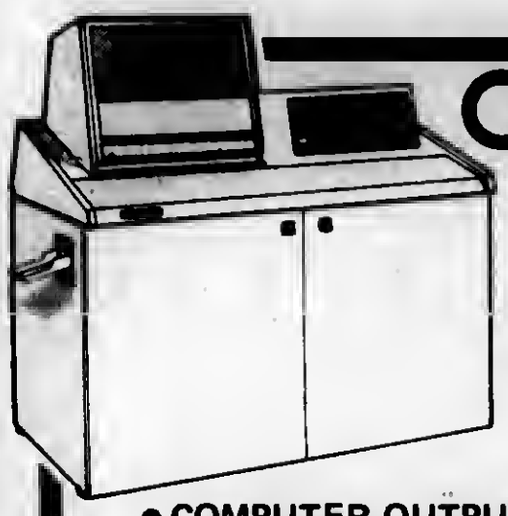
■ Herman Kahn has been elected to the board of directors of Advanced Computer Techniques Corp.

■ Gary G. Friedman, executive vice-president of Itel Corp., additionally has been named vice-chairman of the company. Thomas A. Bartlett, president of Colgate University, was elected to the company's board of directors.

■ All members of the board of directors of On-Line Sysems, Inc. have been reelected by the company's stockholders.

■ Lawrence L. Mayhew has been elected a group vice-president of Tektronix, Inc.

■ Bradford A. Warner has been elected to the board of directors of Datatrol, Inc.



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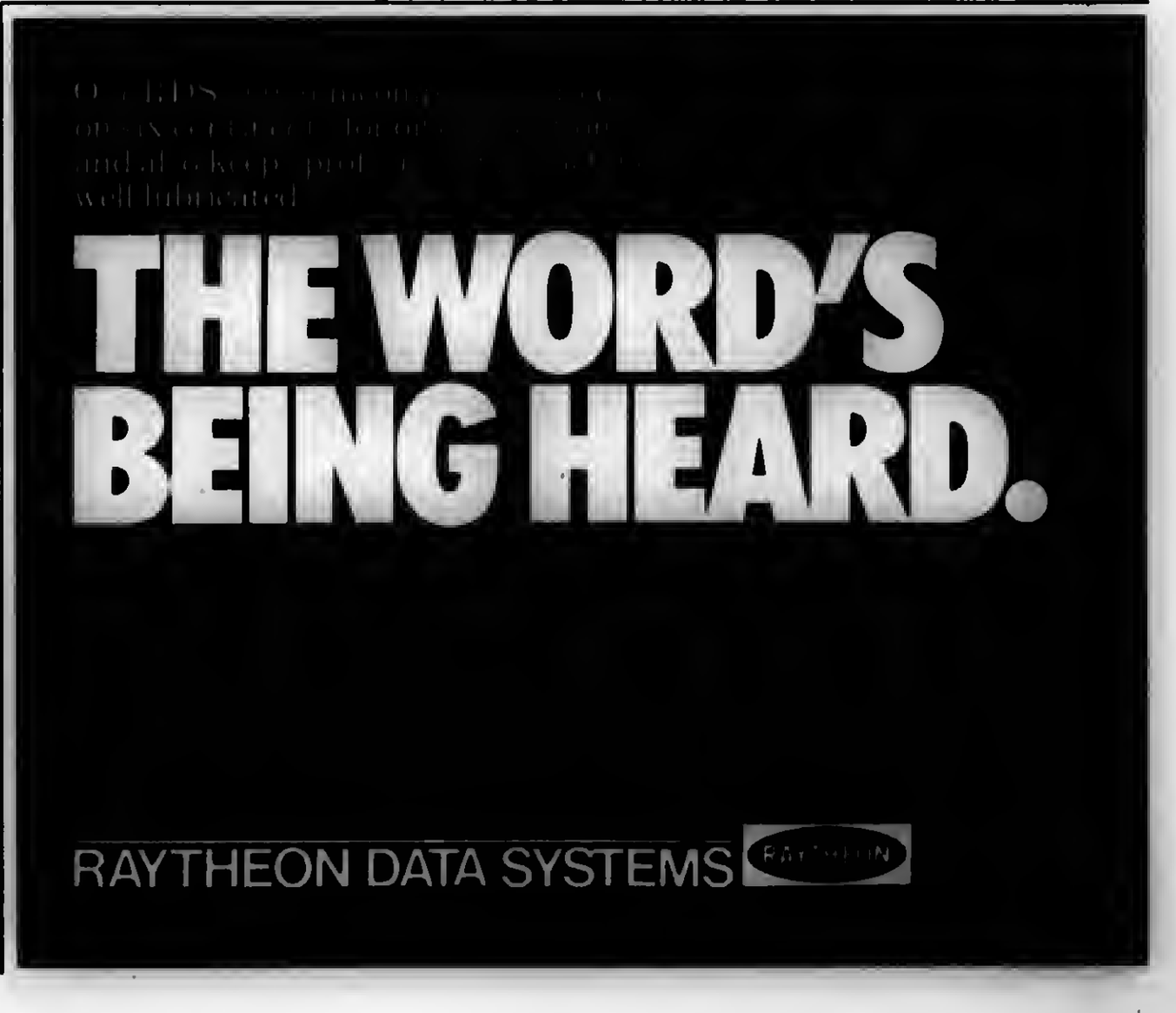
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Company Specializes in Negotiating Contracts for Users

By Toni Wiseman
Of the CW Staff

WINTER PARK, Fla. – For the uninitiated, contract negotiations can be alternatively a headache, an ulcer and a catastrophe. A remedy may, however, be at hand.

International Computer Negotiations, Inc. (ICN) is a recently formed company which specializes solely in negotiating equipment contracts for users.

The company grew out of a perceived need. "I saw such a need, a naivete on the part of users," Joseph Auer, ICN President, said. "Not general naivete, but when it comes to contracts, people treat them much differently."

The company will not help users determine which equipment is best suited to their needs; the evaluation remains the users' concern, according to Auer, who was with Honeywell for six years.

"But once they've decided on the gear, we work with them on alternative acquisition methods and show them the tradeoffs between rental, purchase and various types of financing leases," he said.

The concept behind ICN is it can bring expertise and proven experience to the user who may negotiate a contract only once every three or five years."

Contractual Considerations

"ICN has compiled and maintains a data base of contractual provisions that [a] company would probably not be aware of in the normal course of doing business," Auer said.

"These provisions can help ensure maximum contractural protection – a difficult goal for most companies to achieve in computer negotiations," he added.

There are 20 to 30 contractual considerations – such as on-going maintenance, soft-dollar considerations and time buybacks – which could be requested, Auer noted, but most people don't know enough to demand them.

ICN maintains a compilation of what various vendors are doing for customers. "We're a central source of what they're giving away here, what they've given away there," Auer said.

"We see one user getting a particular concession due to the unique nature of the sales campaign or his needs and the vendor may go a little further in that area because it doesn't have to give away some other things. Pretty soon you've got a good set of parameters of how far it'll go in each area," he said.

"The ideal thing is to get all the concessions for one client," he added.

ICN works on an incentive basis. The fee structure is a minimal retainer plus a reasonable percentage of the customers' savings, Auer said.

For example, on a $6 million deal, the retainer would be $12,000 for a year. If the incentive earned was $36,000, the customer would deduct whatever it had paid of the retainer from the $36,000 and owe ICN the remainder.

ICN's incentive fee percentages vary depending upon the computer manufacturer involved, the particular equipment to be acquired, whether the equipment is new or used and the stage of negotiations, if any, when ICN is retained, Auer said.

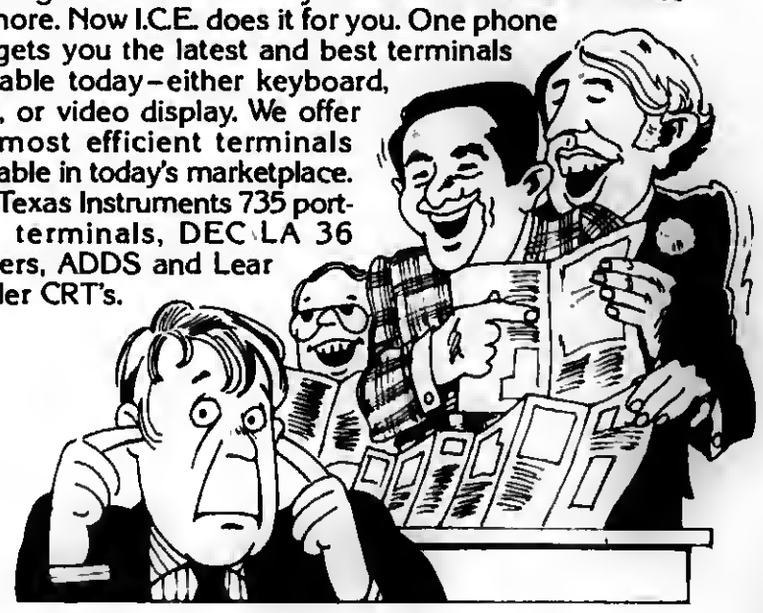
In other words, the fee can be a percentage of the user's savings from the total price of new equipment, a percentage of the user's savings above a predetermined discount from the total price of used or new equipment involving a trade-in or a percentage of the user's savings above the user's own negotiated "best price," Auer explained.

As an additional service to its subscribers, ICN also maintains a file of all clients' resources for identification of nonvendor sources of acquisition and disposition. Auer stressed that this is not brokering, but merely a spin-off service.

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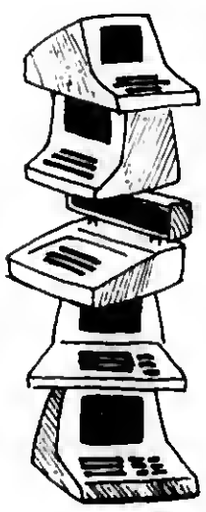
It used to be that getting the best data terminal meant scouring the entire industry to see what was available. No more. Now I.C.E. does it for you. One phone call gets you the latest and best terminals available today–either keyboard, print, or video display. We offer the most efficient terminals available in today's marketplace. Like Texas Instruments 735 portable terminals, DEC LA 36 printers, ADDS and Lear Siegler CRT's.





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Contracts

Computer Sciences Corp. has received a contract valued at about $4 million to provide computer-based services in support of the National Aeronautics and Space Administration's worldwide space flight tracking and data network.

Datatrol, Inc. has received contracts from the First Seneca Bank & Trust Co. and the Pennsylvania Bank & Trust Co. for an on-line teller information system.

Qume Corp. has received a $1.9 million contract from Anderson Jacobson, Inc. for Qume Model Q30 and Sprint 45 character printers.

TRW, Inc. has received a $52.2 million contract from the U.S. Air Force for communications satellites.

Sysorex International, Inc. has been awarded a $2 million contract by the Saudi Arabian army for the development of a computer-controlled micrographic storage and retrieval system.

Anacomp, Inc. has received a facilities management contract from various county agencies in Key West, Fla., for the establishment of a countywide DP cooperative.

Control Data Corp.'s Aerospace Division has been awarded a $1 million follow-on contract from E-Systems for additional quantities of the 469 microcomputer to be used in a low-altitude, long-range cruise missile guidance system.

Incoterm Corp. has received a $650,000 contract from Iberia Airlines for SPD 10/20 intelligent computer terminals and peripheral devices for use in the airline's Resiber II communications reservation system.

Sanders Associates, Inc. has received a $1 million contract from the Simulation Products Division of the Singer Co. for SA-900 graphic display systems for use in helicopter pilot flight-training systems.

Telos Computing, Inc. has been awarded a contract valued at about $500,000 from the Naval Electronic Systems Engineering Center in San Diego, Calif., to provide test, evaluation and training plans for an automated command and control training system.

Intertel, Inc. has been awarded a contract for 2,400 bit/sec modems from GTE Information Systems, Inc. The modems will be a part of a GTE/IS pact to expand the Bache Automated Communications Order Match data communications system.

Evolution 'More Insidious' Than Revolution

By a CW Staff Writer

HOT SPRINGS, Va. – IBM's subtle evolutionary developments can have a "more insidious effect" on change than new design approaches like its Future Systems, Gideon Gartner, vice-president of Oppenheimer & Co., warned computer industry executives here.

"The computer industry should be as concerned about evolution as it is about revolution," he told attendees of the Computer Industry Association's (CIA) annual meeting. One example of this is the IBM 370, which Gartner noted has been called an example of evolutionary rather than revolutionary development by Quantum Sciences Corp.

Gartner also cited IBM's evolution toward a purchase environment. "IBM will still push rental, but the trend toward purchase may be a tactic of last resort," he said.

Purchase plans could be most difficult for plug-compatible manufacturers (PCM) to deal with, barring an exit from the business, since PCMs wouldn't have come about at all had it not been for IBM's rental base, he said.

Pointing to the fact that it takes at least a year for PCMs to make their first shipments of an IBM-compatible product after the original IBM products are shipped, Gartner warned this is an area deserving careful scrutiny.

The notion that IBM is moving toward functional pricing is a major misconception against which the industry must guard, he went on. IBM previously employed functional or transactional pricing – that is, charged for extra shift usage – but the change to a single static shift charge was made in response to competition, and that competition is still there.

Gartner also cautioned the industry must be careful when determining IBM's market share "because we are dealing with flakey information. Do we measure it by revenues, by value of shipments – and in that case, gross or net?"

IBM Purchase of CML Ties Up Industry Pieces

By Catherine Arnst
Of the CW Staff

HOT SPRINGS, Va. – IBM's purchase of a controlling intereat in CML Corp:, Comsat's domestic satellite subsidiary, has brought the concept of System Network Architecture (SNA) just over the horizon, Jules Garfunkel, a computer securities analyst with E.F. Hutton Co., said here recently.

Superimposing a digital network common carrier ability on the DP industry ties the separate pieces together, he said at the Computer Industry Association's (CIA) annual meeting.

"Individual systems or subsystems that were once sold to separate markets for different functions can now be viewed as an integrated entity – an entity with new proportions, new capabilities," he said.

The Federal Trade Commission has already named it "the integrated business information handling industry," he said.

CW at CIA

IBM's acquisition of a common carrier capability has served to focus the attention of the computer industry, investment community and government on the future integrated information-handling industry, Garfunkel said, adding that this future "will provide new opportunities to computer companies for expanded growth."

The companies most successful in participating in thia growth phase will be "those that can provide the greatest number of parts or at least fully integrated parts of the total solution of 'total system services,'" he said.

The computer industry will move into a new stage of development where the computer's abilities will be coordinated and integrated to provide full-service, end-to-end information processing from the point of data creation to its ultimate destination and storage, he said.

"This total systems concept, now made possible by the apparent integration of data processing with digital transmission, will be the key to a new phase of growth," he added.

This growth will at first continue to highlight better intracompany electronic document communications through word processing and specialized industry terminals, Garfunkel said.

From there, he predicted, the industry will concentrate on intercompany communications, thus hastening electronic funds transfer systems, a cashless and checkless society, a centralized stock exchange and electronic mail.

"We will see the beginning of a shift away from the renting or selling of hardware and toward the selling of solutions," he concluded.

System Reliability Crucial

By a CW Staff Writer

HOT SPRINGS, Va. – System reliability is the area that deserves the most attention by the computer industry, a time-sharing industry executive told attendees at the Computer Industry Association (CIA) annual meeting here recently.

"Anytime a system goes down, for whatever reason, user service is interrupted, revenue stops and network credibility suffers," John Luke, president of CSC Infonet, explained.

"The range between success and failure in providing reliability is extremely narrow – anything below 97% reliability for the network is unacceptable," he said.

"Trying to raise this level becomes exceedingly expensive with each fractional gain made," he added.

The problem of maintaining a suitable level of reliability is compounded by the conglomeration of equipment, vendor involvement and other things that make up a network.

"For example," he said, "when a failure occurs, areas represented by a number of vendors may require investigation and trouble analysis to pinpoint the cause.

"Because the prevailing belief seems to be that it has got to be the other follow's equipment that's not working, we sometimes have a problem in obtaining the response needed," he said.

Along with high reliability components comes a need for improved diagnostic and error-detection capabilities, Luke noted.

To maintain a proper level of service, a vendor must be able to perform fault isolation and repair quickly, he said. The ability to run remote diagnostic tests to pinpoint a defective printed circuit board within a unit would be extremely beneficial to network vendors, he added.

"Another contributor to reliability is graceful degradation," he said, explaining a reduced level of performance is preferred over a complete shutdown of the network.

"Perhaps more fail-safe and redundant circuits could be used for key functions to ensure equipment reliability."

"Additionally, if warnings of impending catastrophic failure of an equipment are given, there might be time to correct the problem or start preparation of some alternate means to keep the system in operation," he said.

Standards Time-Consuming: Davis

(Continued from Page 37)

ming language standards, she said, adding "we have one programming language standard – Cobol. Fortran is always about to become a standard in the government and we are working on two others – Basic and APL."

Industry, Congress and the General Accounting Office (GAO) want standards that will increase competition or reduce costs and efficiency, such as interface standards, she said.

NBS has three basic choices in determining standards, Davis explained. "One is to wait until there are de facto standards – whether they are set by Telenet, IBM, Datapac – and then either adopt or try to null and void that de facto standard.

"The second choice is to wait until there's a voluntary standard set up by a voluntary standards organization, such as the American National Standards Institute [Ansi], and then adopt or diverge from it.

"The third option is to start out regardless of what Ansi is doing and regardless of whether there are de facto standards or not and develop a federal standard."

The only justification for developing a federal standard when the first two situations do not exist is when there is sufficient pressure for that standard from federal agencies, Congress, the GAO or the private sector, Davis said.

There are 31 mandatory standards at present, but they are actually only "mandatory unless waived," she said.

"We always waive a standard – with the exception of Cobol, since we now have a software testing service – if a government agency asks us to do so.

"We don't intend to always do so, particularly as we get a little better at standards making and there are better ways of ensuring compliance. There have not been many requests for waivers either," she said.

Guide Lists Rules On Depreciation

CHICAGO – Puzzled on how to depreciate equipment? The Commerce Clearing House (CCH) has published a 1975 Depreciation Guide that covers various depreciation schedules.

The 176-page gulde covers rules on regular depreciation and then the Asset Depreciation Range system with its ranges and repair allowance percentagea, as well as Class Life System for post-1970 depreciation on pre-1971 assets.

The guide also includes the full text of these regulations. It may be obtained for $5 from CCH at 4025 W. Peterson Ave., 60646.

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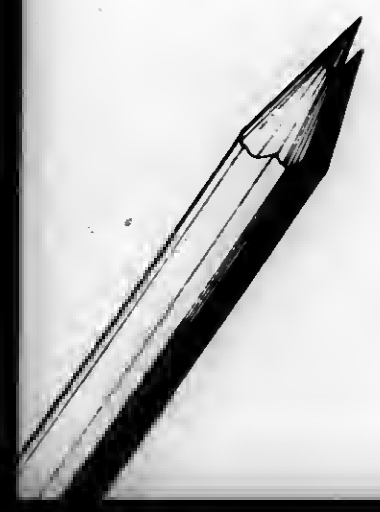
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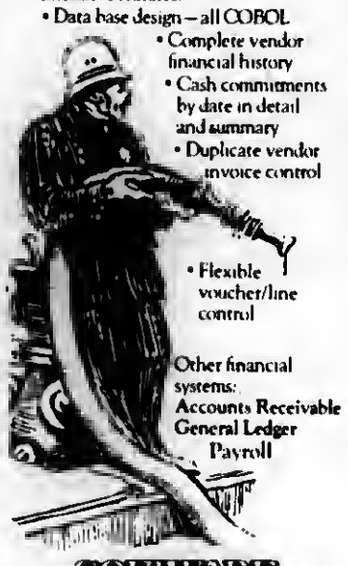
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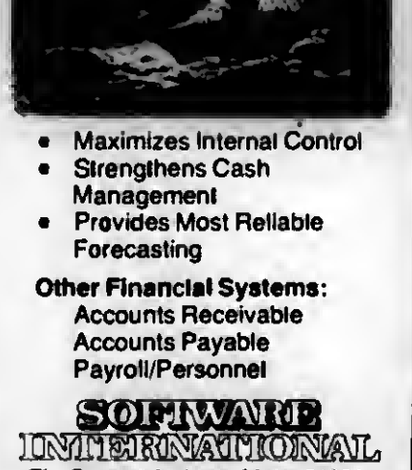
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Burroughs, CDC Earnings Rise in Nine Months...

Control Data Corp. and Burroughs Corp. each showed improved results in the third quarter and nine months compared with the year-ago figures.

Burroughs kept up its momentum in setting records, while CDC's computer results were unencumbered by the $30.2 million in special charges last year stemming from the Union Bank of Switzerland's decision to terminate a development program.

At Burroughs, third-quarter earnings rose 7% to $27.5 million or 69 cents a share compared with $25.8 million or 66 cents a share in the same period last year.

Revenues rose 6% to $367.7 million compared with $346.7 million a year ago.

For the nine months, Burroughs' earnings rose 13% to $91.6 million or $2.31 a share compared with $81.1 million or $2.08 a share in the same period last year.

Revenues in the nine months totaled $1.15 billion, a 10% increase over the $1.05 billion reported in the 1974 period.

Burroughs' total worldwide orders for the nine months increased 3% over the same period last year. Worldwide backlogs continued at a high level, showing a 20% increase since the beginning of the year.

At CDC, computer income increased for both the third quarter and nine months, while contributions from its Commercial Credit financial services subsidiary declined.

Consolidated earnings for the third quarter were $9.6 million or 58 cents a share compared with $7.1 million or 44 cents a share in the year-ago period.

The 1974 period's loss was the result of a special charge of $30.2 million before taxes.

Computer business profits rebounded to $5.1 million in the third quarter from a loss of $13.9 million a year earlier. Revenues increased 8.8% to $310.2 million from $285.2 million.

Income from Commercial Credit Co. declined to $5 million from $7.2 million in the year-ago quarter.

"Rental and services revenues showed encouraging gains," according to William C. Norris, CDC chairman. "Most improvements came in data services and in systems.

"Programs to streamline operations and more effectively manage assets are continuing to show positive results. Computer business indebtedness has declined about $60 million from a high of $730 million a year ago," he said.

"Shipments of the first Model 172, Model 173 and Model 175 computers in the Cyber 170 family were made during the quarter and shipment rates will accelerate in the fourth quarter," he predicted.

"On the other hand, shipments of peripheral products to other systems manufacturers began to slow as the result of order downturns experienced earlier."

Consolidated earnings for the nine months reached $31.6 million or $1.94 a share compared with earnings of $18.1 million or $1.14 a share in the same 1974 period.

Computer business profit for the nine months totaled $7.6 million on revenues of $891.6 million. This compared with a loss of $7.1 million on revenues of $818 million in the first nine months of 1974.

Commercial Credit showed income of $25.2 million compared with $26.4 million in the year-ago period. Results were adversely affected by larger underwriting losses in insurance operations, Norris said.

... While IBM Gains 'Modest' 1%

ARMONK, N.Y. – A 4% increase in IBM's third-quarter earnings helped the firm show almost a 1% increase in earnings for the nine months ended Sept. 30.

Revenues jumped more than 15% over the third quarter of 1974.

Reaching a record level of $495.2 million or $3.32 a share, the third-quarter earnings reflected a greater than 9% increase in outright sales.

"Although the level of outright purchases of DP equipment has continued to increase quarter by quarter through 1975, the nine months total is still below the comparable 1974 period," according to Frank T. Cary, IBM chairman.

"This factor, together with the continuing effects of worldwide inflation, has held the increase in nine months net earnings to a very modest amount, despite an appreciable growth in gross income," he said.

In other 1975 quarters, IBM's net rose a little more than 1% in the first quarter, but was off almost 3% in the second quarter.

Outright sales for the first half were more than 13% below those of the year-ago period, while rental and services increased almost 20%.

During the third quarter, income from sales rose to nearly $1.099 billion from $1.005 billion in the year-ago period. Rentals and services jumped more than 18% to $2.5 billion from $2.1 billion in the same period last year.

Third-quarter revenues rose more than 15% to a record $3.6 billion compared with $3.13 billion in the year-ago period. Earnings for the 1974 period were $477.3 million or $3.23 a share.

For the nine months, earnings totaled $1.4 billion or $9.41 a share compared with $1.39 billion or $9.45 a share in the same period last year.

There was an increase in the number of shares, which IBM said was primarily due to its employee purchase plan.

Revenue in the nine months climbed more than 10% to a record $10.37 billion from $9.39 billion in the year-ago period.

Outright sales for the nine months declined more than 6% to $3.02 billion from $3.2 billion in the same period last year while revenue from rentals and services grew more than 19% to $7.35 billion compared with $6.17 billion in last year's period.

IBM's "other income," principally interest, dropped 20% in the third quarter to $73.8 million from $92.4 million in the year-ago quarter. However, it rose 13% for the nine months to $251.1 million.

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Shr Ernd	$.29	$.06
Revenue	7,999,000	5,217,000
Earnings	585,000	115,000
6 Mo Shr	.65	.....
Revenue	15,612,000	8,068,000
Spec Cred	193,000	.....
Earnings	1,298,000	(671,000)

IDENTICON
Three Months Ended June 30

	1975	1974
Revenue	$268,170	$86,728
Loss	101,517	161,520

DATA DESIGN LABORATORIES
Year Ended June 30

	1975	1974
Shr Ernd	$.68	$.73
Revenue	17,885,000	16,423,000
Earnings	747,000	803,000
3 Mo Shr	.24	.30
Revenue	5,196,000	5,212,000
Earnings	263,000	330,000

MULTIPLE ACCESS
Three Months Ended June 30

	1975	1974
Shr Ernd	$.25	$.37
Revenue	9,995,348	6,977,209
Earnings	709,672	1,049,617

MICROFORM DATA SYSTEMS
Year Ended Aug. 1

	a1975	b1974
Shr Ernd	$.38	$.05
Revenue	20,180,664	9,278,906
Tax Cred	1,038,000	130,000
Earnings	2,030,336	270,182

a-Includes Icot Corp. from date of acquisition, Sept. 29, 1974. b-Restated to reflect change in accounting for R&D costs.

TEKTRONIX
Three Months Ended Aug. 23

	1975	a1974
Shr Ernd	$.66	$.61
Revenue	74,858,000	72,840,000
Earnings	5,760,000	5,310,000

a-Thirteen-week period; restated for Lifo accounting.

WALLACE BUSINESS FORMS
Year Ended July 31

	1975	1974
Shr Ernd	$2.16	$2.04
Revenue	65,582,000	55,719,000
Earnings	4,130,000	3,700,000

ADDRESSOGRAPH MULTIGRAPH
Year Ended July 31

	1975	1974
Shr Ernd	$.61	$.04
Revenue	584,246,000	540,833,000
Earnings	a4,908,000	308,000
3 Mo Shr	.33	.....
Revenue	155,051,000	151,278,000
Earnings	a2,636,000	(1,497,000)

a-Earnings reduced by $829,000 after gain of $1.1 million on a sale of German subsidiary, tax credit of $1.6 million in terminating a Brazilian subsidiary and $3.5 million estimated expenses in restructuring several operations.

DATARAM
Year Ended April 30

	1975	1974
Shr Ernd	$1.27	a$1.39
Revenue	5,997,835	5,322,728
Tax Cred	492,000	352,000
Earnings	648,993	709,326

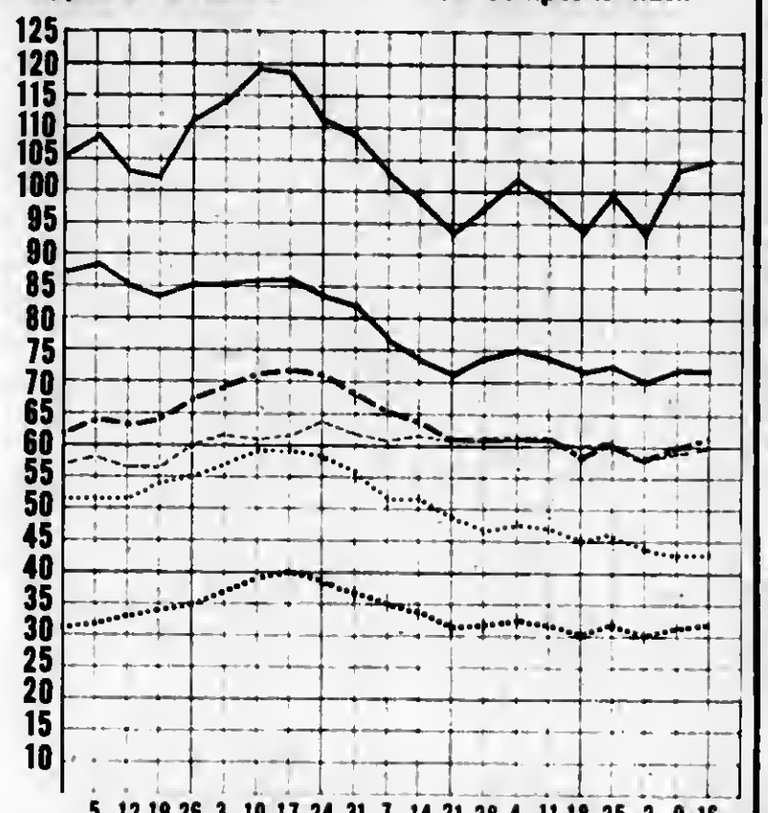
a-Adjusted to reflect a one-for-five reverse stock split in February 1975.

QUANTDR
Year Ended July 31

	1975	1974
Shr Ernd	$.28	$.07
Revenue	13,241,022	7,284,760
Tax Cred	335,000	120,598
Earnings	715,524	264,788

COMPUTERWORLD Computer Stock Trading Indexes

—— Computer Systems ----- Software & EDP Services
····· Peripherals & Subsystems ····· Leasing Companies
-·-·- Supplies & Accessories -·-·- CW Composite Index



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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 15, 1975

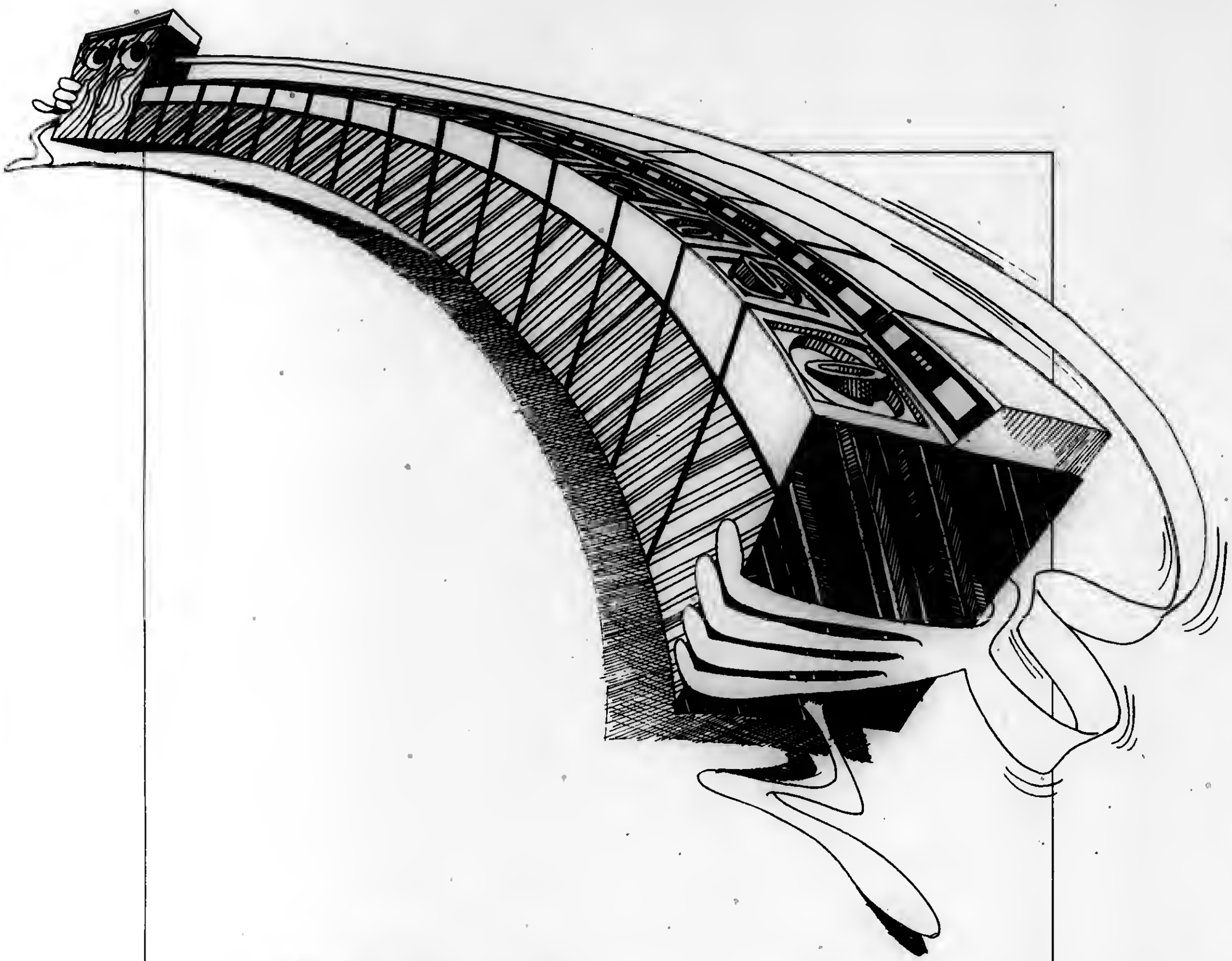
All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE (1)	CLOSE OCT 15 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	91	-5 1/4	-5.4
O	COMPUTER AUTOMATION	2- 10	10 1/4	+ 1/2	+5.1
A	CONTROL DATA CORP	11- 23	20 1/4	+ 7/8	+4.5
N	DATA GENERAL CORP	10- 38	37 7/8	+1 1/4	+3.4
O	DATAPOINT CORP	6- 26	24	+ 3/4	+3.2
C	DIGITAL COMP CONTROL	1- 4	2 3/4	0	0.0
N	DIGITAL EQUIPMENT	46-135	131 1/2	+2	+1.5
N	ELECTRONIC ASSOC.	2- 3	2 1/8	0	0.0
A	ELECTRONIC ENGINEER.	5- 10	8 7/8	+ 1/2	+5.9
N	FOXBORO	23- 42	28 1/8	+1 1/4	+4.6
O	GENERAL AUTOMATION	5- 14	4 5/8	-1	-17.7
C	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	58-120	101 5/8	-1 3/4	-1.6
A	HONEYWELL INC	22- 40	31 7/8	+1 7/8	+6.2
N	IBM	158-224	208 3/4	+2 3/4	+1.3
C	NEWDREK	1- 10	9 1/2	- 1/4	-2.5
O	MICRODATA CORP	2- 6	5 7/8	+ 1/4	+4.4
C	MODULAR COMPUTER SYS	5- 19	11 1/4	0	0.0
N	NCR	15- 39	24 3/8	- 1/8	-0.5
C	PRIME COMPUTER INC	2- 6	4 3/4	0	0.0
N	PERKIN-ELMER	16- 30	25 3/4	+1 5/8	+6.7
N	RAYTHEON CO	26- 59	56 1/8	+2 5/8	+4.9
N	SINGER COMPANY	10- 17	11 3/4	+ 5/8	+5.6
N	SPERRY RAND	26- 49	42 5/8	0	0.0
A	SYSTEMS ENG. LABS	1- 5	3 1/8	0	0.0
N	VARIAN ASSOCIATES	7- 18	14 1/2	- 1/4	-1.6
N	WANG LABS.	7- 17	11 3/8	+ 1/2	+4.5
N	XEROX CORP	51- 86	61 3/4	+3	+5.1
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	3 1/4	- 1/8	-3.7
A	COMMERCE GROUP CORP	2- 4	2 5/8	+ 1/8	+5.0
A	COMPUTER INVSTRS GRP	1- 2	5/8	0	0.0
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	0- 1	3/8	0	0.0
N	DPF INC	3- 6	4 1/2	- 1/8	-2.7
O	EGP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/8	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 5/8	+ 1/8	+5.0
A	ITEL	3- 9	6 1/2	0	0.0
N	LEASCO CORP	4- 8	6 3/4	- 1/8	-1.8
C	LEASPAC CORP	1- 1	1/4	0	0.0
C	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	1/2	- 1/4	-33.3
A	PIONEER TEK CORP	2- 7	5 5/8	+ 1/8	+2.2
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	8 1/8	+1 5/8	+25.0

EXCH		1975 RANGE (1)	CLOSE OCT 15 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	7/8	+ 1/8	+16.6
A	APPLIED DATA RES.	1- 10	1 3/4	+ 1/8	+7.6
A	AUTOMATIC DATA PROC	29- 65	59 3/8	+5 7/8	+10.9
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	CENTRAL DATA SYSTEMS	3- 7	7 3/8	0	0.0
C	COMPUTER DIMENSIONS	2- 6	3	0	0.0
C	COMP ELECTION SYSTMS	3- 6	6	+ 1/4	+4.3
C	COMPUTER HORIZONS	1- 1	1	+ 1/8	+14.2
C	COMPUTER NETWORK	1- 3	2 7/8	+ 1/4	+9.5
N	COMPUTER SCIENCES	2- 6	5	0	0.0
C	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
O	COMPUTER USAGE	2- 4	2 1/4	+ 1/8	+5.8
O	COMSHARE	3- 4	2 3/4	+ 1/8	+4.7
O	DATATAB	1- 2	7/8	- 1/4	-22.2
A	ELECT COMP PROG	1- 1	1/8	- 1/8	-50.0
N	ELECTRONIC DATA SYS.	12- 28	15 1/8	- 1/8	-0.8
O	INFONATIONAL INC	1- 1	1/8	0	0.0
C	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
O	KEANE ASSOCIATES	2- 3	2 3/8	+ 3/8	+18.7
O	KEYDATA CORP	2- 3	2	0	0.0
O	LOGICON	3- 5	3 1/2	+ 1/8	+3.7
A	MANAGEMENT DATA	1- 3	1 7/8	+ 1/8	+7.1
C	NATIONAL CSS INC	6- 14	11 5/8	+ 1/8	+1.0
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	13 1/2	+1 1/2	+12.5
N	PLANNING RESEARCH	2- 6	3 3/4	+ 1/8	+3.4
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	2 7/8	+ 1/4	+9.5
O	REYNOLDS & REYNOLD	10- 24	13 1/2	0	0.0
C	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/8	+ 1/8	+12.5
C	TYMSHARE INC	7- 21	18 1/2	+1 3/8	+8.0
A	URS SYSTEMS	2- 4	3	0	0.0
N	WYLY CORP	2- 4	3	- 3/8	-11.1
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	8 1/8	+ 1/2	+6.5
C	ADVANCED MEMORY SYS	1- 7	5 1/2	+ 1/4	+4.7
N	ANPEX CORP	3- 7	5 5/8	- 1/8	-2.1
C	ANDERSON JACOBSON	1- 3	1 3/4	- 1/4	-12.5
O	BEEHIVE MEDICAL ELEC	1- 5	3 3/8	0	0.0
A	BOLT,BERANEK & NEM	5- 13	9 1/8	- 1/8	-1.3
M	BUNKER-RAMO	4- 8	5	0	0.0
A	CALCOMP	4- 7	3 3/4	0	0.0
O	CAMBRIDGE MEMORIES	2- 5	2 5/8	- 1/4	-8.6
N	CENTRONICS DATA COMP	7- 25	18 7/8	+1 1/8	+6.3
C	CODEX CORP	15- 38	35	+ 1/2	+1.4
C	COGNITRONICS	1- 2	3/4	0	0.0
O	COMPUTER COMMUN.	1- 2	3/4	0	0.0
C	COMPUTER CONSOLES	3- 7	4	- 1/4	-5.8
A	COMPUTER EQUIPMENT	1- 2	1 1/2	0	0.0
O	COMPUTER MACHINERY	1- 2	1	- 1/8	-11.1
C	COMPUTER TRANSCEIVER	1- 2	5/8	+ 1/8	+25.0
C	CONTEN	2- 5	3 3/8	+ 3/8	+12.5

EXCH		1975 RANGE (1)	CLOSE OCT 15 1975	WEEK NET CHNGE	WEEK PCT CHNGE
N	CONRAC CORP	12- 24	23 1/4	+2 1/4	+10.7
O	DATA ACCESS SYSTEMS	1- 3	1 1/4	- 1/4	-16.6
M	DATA 100	5- 16	10 3/4	+ 1/2	+4.8
A	DATA PRODUCTS CORP	2- 6	3 3/4	- 1/4	-6.2
O	DATA TECHNOLOGY	1- 3	1 3/8	- 1/8	-8.3
C	DATUM INC	1- 2	1	0	0.0
O	DECISION DATA COMPUT	4- 7	4	0	0.0
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DIGI-DAT CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	1 1/2	0	0.0
O	FABRI-TEK	1- 1	7/8	0	0.0
C	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	3- 6	3 3/4	- 1/8	-3.2
N	HARRIS CORP	18- 28	26 1/4	+2 3/8	+9.9
A	INCOTERM CORP	3- 12	10	- 1/8	-1.2
C	INFOPEX INC	2- 5	2 7/8	+ 3/8	+15.0
O	INFORMATION INTL INC	8- 14	13 3/4	+ 5/8	+4.7
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
C	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	NILGO ELECTRONICS	8- 24	17 1/4	+2 1/2	+16.9
A	MOHAWK DATA SCI	1- 5	3 1/2	+ 1/8	+3.7
O	OPTICAL SCANNING	1- 3	2 5/8	0	0.0
O	PENRIL CORP	2- 2	3/4	0	0.0
O	PERTEC CORP	2- 8	4 1/2	+ 1/8	+2.8
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1/4	- 1/4	-50.0
O	QUANTOR CORP	2- 6	4 1/8	+ 1/8	+3.1
C	RECOGNITION EQUIP	2- 9	7 1/4	+ 5/8	+9.4
N	SANDERS ASSOCIATES	3- 11	7 3/4	- 1/4	-3.1
C	SCAN DATA	1- 3	1 5/8	0	0.0
O	STORAGE TECHNOLOGY	6- 17	14	+ 3/4	+5.6
O	SYCOR INC	5- 15	14 3/4	+1 1/4	+9.2
O	T RAR INC	3- 6	6 1/4	0	0.0
C	TALLY CORP.	1- 5	3 1/8	0	0.0
O	TEC INC	1- 4	3	0	0.0
N	TEKTRONIX INC	18- 43	39 1/2	- 1/4	-0.6
N	TELEX	1- 3	2 1/2	- 1/2	-16.6
O	MANGCO INC	4- 9	7 1/2	+2 1/4	+42.8
C	MILTEK INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 1/2	0	0.0
A	BARRY WRIGHT	5- 7	6	- 1/8	-2.0
O	CYBERNATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	31 3/4	- 1/4	-0.7
O	DUPLEX PRODUCTS INC	12- 25	15 1/2	+ 3/8	+2.4
N	ENNIS BUS. FORMS	5- 7	4 7/8	0	0.0
O	GRAHAM MAGNETICS	5- 10	8	- 1/4	-3.0
O	GRAPHIC CONTROLS	8- 21	13	+1	+8.3
N	3M COMPANY	43- 60	58	+2 5/8	+4.7
C	MOORE CORP LTD	39- 51	44 3/4	- 1/2	-1.1
N	NASHUA CORP	11- 22	11 5/8	+ 1/4	+2.1
O	STANDARD REGISTER	11- 20	16	+ 1/4	+1.5
O	TAB PRODUCTS CO	4- 8	5	- 3/4	-13.0
N	UARCO	17- 24	18 1/2	+ 1/4	+1.5
O	VANIER GRAPHICS CORP	4- 7	4 1/2	0	0.0
A	WABASH MAGNETICS	3- 5	4	0	0.0
N	WALLACE BUS FORMS	15- 25	16 7/8	0	0.0

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NEWSPAPER



Boston Globe Photo

Boston's Baseball Brouhaha

Fenway Park's left field line is 10 ft shorter than indicated on the ball park wall, according to a computer. See story on Page 4.

ACM '75 Speakers Say

DP Failing as Policymaking Tool

By Edward J. Bride
Of the CW Staff

MINNEAPOLIS – Despite all the benefits computers have brought to businesses, especially at the clerical level, automation has been a dismal failure in corporate board rooms and in creating public policy, several speakers said at the annual conference of the Association for Computing Machinery (ACM) here last week.

ACM '75 coverage continues on Pages 5, 6, 7 and 8.

Taking a cue from the keynote speaker, Alan Westin, who said computers had failed as tools in aiding high-level decisions and long-range policies, several panel members gave a rationale for these failures.

And it all boiled down to this: Politics, rather than rational or statistical motives, is the basis for most decisions in public policy.

Information systems are designed for the sake of maximizing existing programs, rather than for justice and equality, according to Kenneth Laudon of the Center for Policy Research and author of a new book called *Computers and Bureaucratic Reform*.

For example, the establishment of regional computer centers for New York's welfare data processing has made it more expensive and difficult to serve welfare recipients because some branch offices were closed as the regional centers were established, he noted.

The use of computers to trace delinquent fathers who were not paying child support amounted to "catching the poor, the penniless, the jobless," rather than serving some higher public goal, Laudon said.

The catching of "scofflaws" who avoid paying traffic fines, but who are now being traced

(Continued on Page 4)

Imsai Arrays Micros For Low-Cost Power

By Ronald A. Frank
Of the CW Staff

SAN LEANDRO, Calif. – IMS Associates, Inc. (Imsai) has combined multiple Intel 8080 microprocessors into an array configuration that can give sophisticated large-system users high processing capability at relatively low cost, the firm said.

Called the Hypercube, the microprocessor array is available in three sizes, each of which reportedly equals the processing power of a conventional system for approximately an order of magnitude less cost. The smallest Hypercube II contains 32 8080 microprocessors and contains processing power comparable to the IBM 360/65. It is housed in one 6-foot-high 19-inch frame and costs $80,000.

The Hypercube II contains 132 8080 microprocessors and contains processing power comparable to an IBM 370/195, according to the company. It is housed on two 19-inch cabinets and costs $400,000.

The largest configuration is designated the Hypercube IV and contains 512 8080 microprocessors. It is housed in eight cabinets and its processing power is beyond any commercially available system, the company said. It costs $1,280,000.

Each array contains logical nodes which have a system processor and a user task processor. A node can be connected to an external user task memory which can be an I/O storage device shared among several nodes.

Each processor in a logical node is actuallly a portion of a discrete microprocessor in the array which makes it almost impossible for a complete node to malfunction except in catastrophic cases, Imsai said.

An individual node can handle a maximum of 2M byte/sec of I/O volume which is described by the company as being equivalent to handling dual IBM 3330 disk strings per second.

But the Hypercube presently is limited to using 8080-compatible I/O devices which precludes the interfacing of IBM-type I/O subsystems.

The company's 108 intelligent disk system [CW, Aug. 13] can be interfaced to a Hypercube to provide up to 16 Calcomp Trident disk drives per array node. Terminals with RS-232 interfaces can also be interfaced to an

(Continued on Page 3)

Registered Non-Bell Modem Connected To Calif. Phone System Without DAA

By Ronald A. Frank
Of the CW Staff

SAN FRANCISCO – Late last week a non-Bell modem was connected to the telephone system in this area without a phone company Data Access Arrangement (DAA). The modem contained built-in circuitry which was certified and registered by the California Public Utilities Commission (PUC) as being functionally equivalent to a DAA.

The modem was certified by a registered electrical engineer as provided by the PUC in May of this year when it issued a general order outlining the procedures to be followed to eliminate the use of DAAs on intrastate services within California.

The first use of a registered modem occurred when a Hewlett-Packard (HP) 2644 CRT was connected to a phone line with a Vadic Corp. 3400 modem that had been approved for use without a DAA.

The CRT was being demonstrated for a user interested in the 2644 and data was transmitted to an HP 2000 Access system in Palo Alto, Calif. Data was also transmitted to an HP 3000 CPU to demonstrate a source data entry software package.

Certification of the Vadic modem was done by Gaines Crook & Associates, consulting engineers in Chatsworth, Calif., and a detailed technical report of more than 30 pages was sent to the PUC. One of the findings of the consultants was that "the network protection afforded by the [Vadic] 82050 DAA is as good as the 'Protective Connecting Arrangements' offered by the public utility telephone companies as protection against harm to the line." The approved Vadic modems have built-in DAAs which are functionally equivalent to Bell CBS and CBT units.

Both Pacific Telephone & Telegraph and General Telephone filed informal comments objecting to portions of the consultants' certification report. But these were not serious enough to halt registration of the Vadic modems, a PUC spokesman said.

Although the Vadic modems with built-in DAAs were found to comply with Bell System specifications designed to prevent harm, the consulting engineers recommended some additional circuit modifications.

These changes were described as conservative and were designed to make certain the Vadic modems with DAA-equivalents would meet the required protective parameters.

(Continued on Page 3)

Court Hears IBM Writ Request

By Edith Holmes
Of the CW Staff

NEW YORK – IBM last week told a special appeals court session its defense in the government's antitrust trial has been severely impaired due to "repeated arbitrary and unlawful actions" taken by Chief Justice Judge David N. Edelstein.

To remedy what it called "irreparable injury upon our capacity to present a defense," IBM counsel has asked the three-judge appellate court panel to grant a writ of mandamus [CW, Oct. 22].

For its part, the government asked the Second Circuit Court of Appeals to deny this request for mandamus on the grounds that the actions of the district court judge are well within his discretionary purview, particularly in a case of this size and complexity.

If allowed, the writ would amount to an order to Edelstein to vacate his orders imposing certain conditions on witness interviews and would limit his control of the filing of papers submitted by the parties and of particular guidelines for the filing of motions.

No mention was made in the formal remarks of either party about those papers filed by IBM with the second circuit which remain sealed. Relating directly to charges of misconduct by attorneys on both sides, these letters and affidavits by the lawyers involved brought some questions from the appeals court, but were dealt with only vaguely during the hearing.

Thomas D. Barr, lead attorney for IBM from the firm of Cravath, Swaine and Moore, spoke first before the judges, Ellsworth A. Graafeiland, Leonard P. Moore and Thomas J. Meskill. He argued there are two central problems in Edelstein's handling of the government's antitrust suit against IBM which prompted the petition for such an unusual writ.

The first of these is the chief judge's refusal to allow IBM to interview government witnesses

(Continued on Page 2)

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Most Costs to Rise 4%

Honeywell Follows IBM in Price Hikes

By Patrick Ward
Of the CW Staff

WALTHAM, Mass. – The price of most Honeywell equipment is going up by about the same number of percentage points as IBM announced when it hiked its price three weeks earlier [CW, Oct. 8].

The purchase and monthly rental cost of most Honeywell equipment will rise 4% on Nov. 1. Some service and maintenance charges will also go up from 5% to 10%.

The price changes will be effective Feb. 1 for equipment already under contract.

Honeywell blamed the price hikes on the "continuing pressures of inflation and rising costs."

The purchase price increase will affect most large central systems and some peripherals in the Series 60 and Series 6000 lines. However, the prices of smaller Series 60 machines, the Level 61 and 62, are not going up. Neither are the prices of the peripherals exclusively used on those models.

Model 516 central processors, selected communications equipment and nonstandard hardware configurations are also going up.

Rental Increases

The rental price increases will affect the large-scale Series 60 Level 66 and 68 CPUs and most of the Series 6000 line. It will also apply to most Series 200 and 2000 CPUs, System 700 and Model 316, 516, 1642, 1644, 1646, 1648 and 55 CPUs, Honeywell said.

The 4% price rise also applies to most of the peripherals used on those systems, with the exception of peripherals exclusively used on the Series 60 Level 61 and 62 CPUs.

Data entry equipment, nonstandard products and some communications gear, excluding terminals, will also rise by 4%.

There will be a 2% rise in monthly rental for Model 636, 6023 and 6051 central processors.

Honeywell said maintenance charges on most of its computer equipment will go up by 9%. However, the Level 61 and 62 and Model 58 CPUs and some of their peripherals will escape the maintenance charge increase. So will some Honeywell communications gear and all the company's terminals.

Systems engineering and data services rates will be increased by 10%, and other program products by 5%, Honeywell said.

Appeals Court Reviews Writ Request

(Continued from Page 1)

privately before they take the stand, thus "daily prejudicing IBM's ability to erossexamine witnesses." Secondly, the corporation has been unable to protect the record in the lower court because the judge will not file IBM's papers or permit IBM to make oral motions in the course of the trial, Barr added.

'Shaky' Grounds

The IBM attorney provided the appeals court with two examples of instances where the defense felt Edelstein pushed aside crucial matters on shaky procedural grounds.

One episode related to the defendant's unsuccessful effort to have an order vacated which was issued by the judge in May and required a transcript be taken or opposing counsel be present when witnesses are being interviewed informally prior to testifying before the court [CW, Oct. 15].

The second instance referred to the district court's refusal to file IBM papers protesting a request by the government for additional discovery of IBM documents.

In this second case, Barr noted, "I will deal with this entirely in terms of technicalities because that is the way Judge Edelstein has dealt with the matter."

"These are two of the most recent and two of the worst examples of Judge Edelstein's misconduct," the IBM lawyer said.

Speaking on behalf of the government and Judge Edelstein at the request of the court of appeals, Bruce B. Wilson, chief deputy attorney with the Antitrust Division of the Department of Justice, maintained the extraordinary writ "should be used only where the district court has clearly abused its power."

Arriving last week from Washington, D.C., specifically for this hearing, Wilson said he couldn't think of a case in greater danger of "pieeemeal review" than U.S. vs. IBM.

He urged the appeals court to leave the case in the hands of the district court for the time being, warning that if the second circuit granted IBM's petition for this write of mandamus, the judges could expect a flood of petitions from the defendant every time events aren't tending its way.

Harrassment of Witnesses Cited

Wilson argued further Edelstein has simply adopted these procedures to expedite a complicated and cumbersome trial. The order regarding the interviewing of witnesses, to which Barr concurred at the time it was adopted, was devised because the corporation was "harrassing" government witnesses, he noted.

Similarly, Edelstein's rulings concerning oral motions followed IBM's attempt to bring and to argue an excessive number of motions during the trial, Wilson added.

Stressing that the government, too, has been under the same restrictions IBM has had to deal with, the Justice Department attorney said that, even taken together, IBM's complaints "do not constitute mandamus material."

"We deny the district court has erred," he stated. "But even if Judge Edelstein has or does make some error, it is not the appropriate time for appellate review." There is no need for intervention by the appeals court at this point in a trial that is already going on, Wilson added.

Extent of Violations

Following his presentation, the appeals judges asked Barr to explain the extent to which he felt his client's rights had been violated by Edelstein's orders – beyond the instances cited.

Of Wilson, the panel demanded to know how an appeals court would know what papers had been presented by either party unless they were filed by the trial judge and so entered into the record.

Wilson was also asked whether he seriously considered the transcript procedure to be reasonable.

The appeals court also wanted to know how Edelstein, as the trier of fact in this case, had any right to review these transcripts of witness interviews – as he has on a least one occasion.

They asked whether Edelstein's action in this matter wasn't "tantamount to placing himself at counsel table."

The panel retired without rendering an immediate judgment on the matter.

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Imsai Arrays Microprocessors For High-Power CPU at Low Cost

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array node.

Each microprocessor in an array can be performed for an individual application in Intel 8080 Assembler language. Tasks are assigned to the system processor in a node which in turn selects a user task processor to carry out the function.

The three components of a logical node are made up of elements that are in contention for assignment and are drawn from one of the various microprocessors in the array.

Major Applications

Major applications of the Hypercube technology are expected to include on-line information retrieval systems with a common data base accessed by several hundred terminals, time-sharing networks and message-switching applications.

The array concept is also suited for array processing such as is done in the polling of instrumentation, process control and simulation, the company said.

Every "node" of the Hypercube has:

- An instruction execution rate of 1 million instruction/sec.
- A Direct Memory Access (DMA) capacity of 2M byte/sec.
- 16K bytes of user program memory – expandable to 64K.

Thus, the Hypercube III, for example, provides an aggregate instruction execution rate of 81 million execution/sec, a DMA capacity of 162M byte/sec and a total user program memory of 1.2M bytes (expandable to 5M bytes), the vendor said.

Hypercubes are supplied with the Hypercube Operating System (HOS), which resides entirely in firmware. HOS supports all associated I/O device controllers and provides for all internodal user and system communications.

Four-dimensional architecture gives each node eight independent data paths to. HOS "assuring failsoft internodal communication," according to the firm. Any data path or communication link interruption is detected by HOS and a new optimum alternate path is selected with the break being appropriately reported.

HOS also provides facilities for a task supervisor to detect and report a node malfunction with reassignment of the task to a healthy node.

	Hypercube II (Order 2)	Hypercube III (Order 3)	Hypercube IV (Order 4)
Aggregate instruction execution/sec	16 million	81 million	256 million
Aggregate programmed I/O capacity/sec	4M bytes	20M bytes	64M bytes
Aggregate DMA capacity/sec	32M bytes	162M bytes	512M bytes
Number of I/O device controllers attachable	96	216	384
Number of concurrently operating tasks	16	81	256
Standard user program memory size	256K bytes	1M byte	4M bytes
Optional fully expanded user program memory	1.2M bytes	5M bytes	16M bytes
Cost	$80,000	$400,000	$1,280,000

Imsai Hypercube Capabilities and Cost

Maintenance of the Hypercube systems will be done by Sorbus, Inc. at about 1% per month of the purchase price. The first system is scheduled to be installed in February and will probably by a Hypercube III configuration, a spokesman said. Imsai is at 1922 Republic Ave., 94577.

For State Systems

U.S. Relents on Dedication Issue

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – In response to pressure from governors, state attorneys general and state information systems administrators, the Justice Department and the Law Enforcement Assistance Administration (LEAA) have backed off on insisting dedicated computers be used for state criminal justice information systems.

The proposed change to the original criminal justice information-handling rules, which went into effect June 19, was published in the *Federal Register* last Friday.

In issuing the proposed change, "the Justice Department and the LEAA have acknowledged a variety of configurations can be used to meet the security and privacy standards achieved by total dedication," a Justice Department spokeswoman said.

The change has placed within the state criminal justice agency the responsibility for assuring whatever computer system is selected for criminal justice information handling meets the security requirements established by the June 19 rules.

"As long as a computer system and its personnel is under the control and supervision of a criminal justice agency, almost any type of secure system will be accepted," she said.

Interested in Security

"We're interested in security, not dedication per se. Besides, every governor in the country is down our backs," the Justice Department spokeswoman said.

"In addition, technology has been changing, and we have become convinced there are means other than dedication that are equally secure."

Only the part dealing with dedication has been changed. All other sections concerning completeness and accuracy of records, limitations on dissemination and juvenile records for example, as well as personnel policies for those handling secure information remain the same.

Public hearings have been scheduled tentatively in Washington on Nov. 17-18, Nov. 21 in Atlanta and Dec. 4 in San Francisco.

Written comments will be accepted until Dec. 5, after which federal officials will "digest and analyze" comments and witness transcripts to aid in writing the final regulation.

The amended regulation will go into effect in January or February.

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DP Helps Resolve Fenway Park Dispute

BOSTON – Using an aerial photograph and a computer, the *Boston Globe* newspaper finally resolved the dispute over how far it really is from Fenway Park's home plate to the left field fence, and it's just what everybody thought – quite a bit shorter than the posted 315 feet.

According to the *Globe*, the distance is actually only 304.779 feet, making Fenway Park's left field wall the shortest in the major leagues. It's even shorter than Baltimore's, where the foul line bounding left field measures only 309 feet from home plate, the *Globe* said.

Over the years, baseball players and writers alike have asked to measure it. Curiosity was heightened by Red Sox officials who refused to permit it.

So what does this all mean? Absolutely nothing, according to sports writer Monty Montgomery, whose buddy did the math problem as a favor.

While it may not mean anything, it was fun to talk about last week while fans waited longingly for overcast skies to clear and the World Series to get going again.

To do the calculations from the aerial photo dug out of the *Globe's* files, the mapping expert used lenses developed during World War II for aerial reconnaissance, simple trigonometry, a computer of undisclosed make and model and some "company time."

The unknown number was determined using known, undisputed distances that appeared in the same photograph, including the diamond's 90 foot sides, the distance to the visiting team's bullpen, which is 329 feet, and the distance to the intersection of the left and centerfield walls, which is 379 feet.

Any distortion caused by the angle of the photograph applies to the known and unknown dimension equally, the *Globe* said.

ACM '75 Speakers Say

DP Failure as Policymaking Aid

(Continued from Page 1)

effectively through computerization is another computer application of minor importance.

He also criticized the use of computers to detect welfare fraud by recipients, while little has been done to check up on the providers of welfare services, nursing homes, pharmacies, etc.

The closing of prisons is unlikely, despite DP-based studies which have blamed prisons for the high rate of recidivism, Laudon said. Prisons are "crime schools," but little will be done about this problem, at least until the politicians make some political, not scientific, decisions, he said.

Technology's Impact 'Trivial'

"No technical innovation changes the direction in which society is moving," Laudon said. Technology's impact on society is "trivial" in this regard, and things change when the public wants them to change, not when data can prove a point, he said.

Despite all these problems, computers can be used to help organizations avoid failures in making decisions, largely because computers facilitate sharing of data, according to Robert Kling of the University of California in Irvine.

This sharing of data and models can lead to more informed policymaking, Kling said. Other panel members were skeptical that representatives of two sides of an issue could or should cooperate, since they collect different data for different arguments.

Anthony Wasserman of the University of California, however, said two intelligent people given the same data can reach different conclusions. Furthermore, it is impossible to predict the issues which will be important in public policy, he continued.

"You never know what your influence is," according to Consultant Dan McCracken, who urged the audience to provide input to legislators. Decisions must be made with incomplete data, and therefore input from technicians is important, he said.

As one example, John Gentile, assistant postmaster general for management research at the U.S. Postal Service, cited the use of computers to determine routes for letter carriers.

Despite the fact information is "clearly documented," the unions fear the loss of 15,000 jobs and, therefore, implementation of this computer application is awaiting a final decision, Gentile said.

The Postal Service wants to close several thousand "fourth-class" post offices which are losing money, but Congress will not permit this, fearing repercussions from voters, he said.

"The numbers are there" on these unprofitable offices, but a final decision is "pending some compromise" with the Congress, Gentile said.

"The real world is not binary," he continued, noting most high-level decisions amount to "political compromise."

Modem Connected Without DAA

(Continued from Page 1)

One of the problems encountered by the consulting engineering firm during the certification tests was a difficulty in determining the characteristics of Bell DAAs. Since these units are made by the phone company, they have never been tested according to the strict parameters spelled out for non-Bell equivalents, Gaines Crook, president of the consulting firm, said.

Vadic has been producing the built-in DAAs for some time, although the installation last week marked the first approved installation at a user site. Previously these modems have been supplied to overseas users, but the California registration allows their use on intrastate links.

Similar proposals for the certification and registration of non-Bell modems are pending before the Federal Communications Commission (FCC) for interstate services. More than 28 companies recently sent comments on the proposals to the FCC [CW, August 6].

The Interconnection Office of the FCC staff reportedly is ready to submit its recommendations on the liberalized interconnection proposals to the commission. The project is said to have high priority with the commissioners, but no date has been set when the commission will vote on the issue.

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DPers Urged to Add Expertise to Automated Voting

By Molly Upton
Of the CW Staff

MINNEAPOLIS – Computer professionals should play a larger role in assisting local and state election officials with procedures for computerized voting, according to panelists at the Association for Computing Machinery ACM '75 session on computers in the electoral process here last week.

CW at ACM '75

State legislators and local government administrators need the expertise that computer scientists and specialists can supply to assure the security and accuracy of computerized elections and prevent the loss of public confidence in the results, Roy G. Saltman of the National Bureau of Standards (NBS) said.

David Dunbar, president of Computer Election Systems, Inc. urged computer people to help out by either writing programs to tally ballots, offering DP centers for counting votes or acting as official computer center observers during the counting process.

Thomas Harbron, director of the computer center at Anderson College, stressed the need for vote-counting programs with clear audit trails.

Saltman, who authored the NBS report on the "Effective Use of Computer Technology in Vote Tallying," said the principal element contributing to previous snags in electronic vote counting was management failures.

Technology and management are inextricably linked, he said, emphasizing the need for help from the computer community.

"The effective use of technology requires management control and the effective management of technology requires the utilization of appropriate technical expertise," he said.

Proper management could have uncovered and prevented most of the casual factors in previous vote-counting snafus such as human operational failure and technical failures, he said.

Expertise Often Unavailable

The NBS report concluded that the expertise necessary to manage advanced election technology is not available on the staffs of many local jurisdictions, Saltman said.

In such jurisdictions, vendors tend to conduct a significant part of the election on the jurisdiction's behalf and situations in which conflict of interest is a serious concern may arise if vote-tallying activities do not go according to plan, he said.

Saltman proposed a three-step process for operation of vote-tallying systems, beginning with acceptance of hardware and software for future use based on conformance with specifications.

The second step is the operational checkout of components, including any modifications necessary for a particular election, while the third step is the actual operation of the system during and after the election.

Improvements need to be effected in areas ranging from physical control over ballots, hard-copy computer records and storage media containing programs to provide for machine recounting of ballots on alternate, independently managed systems, he said.

Dunbar, whose firm makes vote-tallying machines, suggested computer professionals could write ballot-tallying programs, although most regions get these free from vendors.

Program Environment Needs Rich Language

By Don Leavitt
Of the CW Staff

MINNEAPOLIS – The real problem in the program environment is to find a language rich enough to express application logic and still retain control of the executing program, Charles G. Moore, vice-president of Cyphernetics, Inc., said here last week.

Admittedly playing the devil's advocate in an ACM '75 session on programming environments, he urged the other panelists to recognize the difference between the "programmers' environment" and the "program environment." The first is determined by room color, whether the programmer can work in batch or interactive mode and similar factors outside the program itself.

The program environment, on the other hand, is a tremendous intellectual complexity, entailing such elements as the programming language, the operating system, libraries, the real machine on which the work is to be done and compilers.

He noted that APL and Basic are relatively complete, closed systems. They can't be extended to cover apparently unique application problems, but the intellectual effort needed to work with them "fairly comfortably" is to read "the manual (period)."

More flexible languages, Fortran for example, can also be put to use on simple problems by reading manuals, but to use them effectively the programmer has to learn about file systems, operating systems and ultimately data representations at the machine level so that dumps can be "translated."

Evan L. Ivie of Bell Laboratories admitted the programming staff at his installation had had feelings of frustration with their environment. But the labs have overcome that problem to a large extent through development of a "programmers' workbench."

The major advantage of this workbench, he said, is that it puts development work on a unique computer system, separate from but linked to a number of different target CPUs normally devoted to production work. More than that, it provides the programmers with space to work, tools for development efforts and reference manuals.

The workbench machines are Digital Equipment Corp. PDP-11s accessed by terminals in the programmers' area and linked to a variety of IBM, Univac and Xerox CPUs. It operates under a Bell-developed operating system, Ivie added.

The intermediate development machines support almost all the development functions from functional definitions, design and implementation through testing and evaluation, installation and operations support and maintenance.



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Proper Use of Programming Methods Avoids Nightmares

By Don Leavitt
Of the CW Staff

MINNEAPOLIS – Mixing conventional and structured programming techniques in a single program creates a "nightmare," but used properly some of the newer techniques can have a big payoff, George P. DiNardo said here last week.

CW at ACM '75

Addressing an Association for Computing Machinery (ACM) session on software management, the head of information services at Pittsburgh, Pa.'s Mellon Bank said he is "confused" by various aspects of structured programming. Since his programmers depend on knowing what they're doing, he isn't going to impose new things on them without plenty of planning.

As far as he can determine, DiNardo added, "structured programming" is more a form of discipline than the imposition of a limited number of control structures. Despite the criticisms of some current languages, he feels "any of them can be used in the new spirit."

Wishful Thinking

Returning to specific programming concepts, he voiced a wish – obtusely directed at fellow panelist F. Terry Baker of IBM – for reports of quantifiable savings in development work that could be attributed to structured programming.

As far as he was concerned, he said, the Time-Sharing Option (TSO) symbolic debug facility – which has nothing to do with structured programming – has produced impressive results in his installation.

Altogether, Mellon trained 135 programmers in the techniques and gained more than 100% improvement in productivity. Resulting programs were all completed earlier than expected, largely because test runs were reduced 50% with the debug support, he said.

In any case, structured programming is only one tehnique a DP shop can use to improve its production, DiNardo said. Perhaps more important is the recognition that programmers really are creative and that managers are results-oriented.

Recognizing that, revamping the way a shop functions should start with top-down design and development, he said. Later, once the programmers see the clarity provided by the high level top-down approach, they will be more willing to work with top-down coding routines that are their part of structured programming.

Earlier, panel Chairman Leon Presser of the University of California in Santa Barbara outlined why he thought conventional approaches to software projects often went wrong. Basically, he said, there is too little visibility of what is actually happening in the development process.

To solve that problem, users have to define the historical information needed by various levels of management, the sources of that infomration and the tools and techniques needed to collect it, Presser said.

In many installations, he noted, historical data on previous projects is just plain unavailable. Beyond that, however, much of the accounting data that is used by some shops is inapplicable to the development of meaningful planning for later projects.

Managers have to be concerned with the cost and time required by various projects, as well as some measure of the quality of the products they generate. The organizational structure and methodology used in the old projects should also be available to provide perspective, Presser said.

This information should be available in a historical data base, in the computer center records, from the manager of the operation or from some of the workers. The data base approach might be the most objective, he suggested.

For managers with that kind of information available, the new techniques of stepwise refinement, production libraries, walk-throughs, inspection teams and structured languages might help, Presser said. Without the background, there is no way to know how well current projects are doing, he said.

Broad Privacy Bill Unlikely This Year, ACM Keynoter Says

MINNEAPOLIS – Although it's highly unlikely Congress will pass any broad legislation in the privacy area such as Bill 1984, there could well be specific legislation in several areas this year, Columbia University Professor Alan F. Westin predicted here last week.

Passage of the Koch-Goldwater Bill (1984), which would establish privacy regulations in the private sector, is unlikely because the Congress established the Privacy Commission and gave it a two-year mandate to investigate this and other issues, he said.

"It is unlikely Congress would prejudge the commission," Westin told a press conference at the annual meeting of the Association for Computing Machinery.

However, there could well be legislation governing the use of records in specific areas such as the Criminal Justice Information System, amendments to the Fair Credit Reporting Act, banking, and also possibly national health insurance, he said.

Observing the privacy issue has emerged from a decade of alarm and empirical studies into one of legislation, Westin said the public is recognizing it is hard for legislators to decide what boundaries to set. Emphasis is now on providing a structure of public standards on which to build up a case-by-case system of jurisprudence, he added.

Sammet Probing Roster Sales

MINNEAPOLIS – Admitting some embarrassment, the president of the Association for Computing Machinery (ACM) is trying to find out how anyone can buy the complete roster of the 30,000 ACM members while the ACM policy stated the roster is for the "personal use of members only."

At a member-officer forum held during the annual ACM conference here last week, Jean Sammet, noting "I have a red face" on this matter, said she would have headquarters staff investigate the policy and procedures surrounding the sale of the roster.

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But Not All-Powerful Tool

DP Seen Increasing Efficiency of Power Structure

By Molly Upton
Of the CW Staff

MINNEAPOLIS – Although computers have not been an agent for social change in the last two decades, neither have they served as an all-powerful tool for those using them over those who lack power, Columbia University Professor Alan Westin told attendees at the Association for Computing Machinery annual conference here last week.

CW at ACM '75

Computers have increased the efficiency of the existing power structure, but their role has been as an extension of human facilities rather than as an instrument facilitating broad-scale decision making, as management information systems enthusiasts had hoped, he said in the keynote address.

Key issues confronting the world are societal in nature, he emphasized. While the effect of computers on issues such as privacy may be to intensify them, that effect will not be to generate dramatic change, he said.

DPers As Advisers

The principal role of computer professionals will be as advisers on how DP power can be used, rather than as independent controllers of that power, Westin said.

In contrast to some of the older professions such as medicine or law where services are administered on a personal basis, the DP professional is more likely to function as a hired expert or counselor, he said.

Society is increasingly taking upon itself the responsibility for solving issues and turning to DP people to advise them on technical means to achieve its goals, Westin said.

Decisions regarding distribution of power, individual privacy, citizen participation and organizational decision making in government are affected and perpetuated by existing sociological patterns rather than by technology, as some had previously expected, he said.

Privacy Struggle

Even in the area of individual privacy, the basic struggle of the next decade will be "primarily a social policy conflict. The conflict will be between those offering a system maintenance approach to privacy designed to win subject acceptance of automated systems and a social reform approach that seeks to use privacy challenges to change standards as to who obtains the rewards of our society," he said.

DP has reinforced the patterns of data collection and access, and the intensification has made the issue of paramount importance in America. "But even without DP, American society was coming to grips with the idea of recordkeeping," Westin said.

For, although it was assumed in the '60s the inevitable effect of DP would be to collect more intrusive personal data about people, exchange it more widely among organizations and make individual access control more difficult, this has not been the case, according to studies such as the National Academy of Sciences' Project on Computer Data Banks, he said.

Similarly, the expected trend toward organizational centralization has not materialized to the expected extent since there are so many ways of structuring DP facilities using minicomputers and distributed processing. "Organizations can choose the degree of centralization; they are not prisoners of technology," Westin said.

Government Decision Making

Computer technology in government organizational decision making has had its main impact on day-to-day line operations, with the least impact on planning and management strategic decisions, as management information systems advocates had hoped, he said.

One of the reasons for this failure is "decisions are primarily based on political rather than purely rational" considerations, he added. Also, the tradition of departmentalism, federalism and other institutional tendencies has led to intractability of American dispersion of power, he said.

Another factor is the "absence during the past two decades of any major reorganization of American political institutions around which computer technology might have been organized," he said.

The battle for control of DP in organizations is deeply embedded in the structure of management, he added.

Westin was skeptical about the potential of computers to increase citizen participation through computer/communications technologies such as voting at home, town hall meetings and national referenda via electronics.

He termed this more a "preoccupation with a gimmick rather than an analysis of participation."

This use would raise fundamental questions involving the technical aspects such as who would control this type of polling mechanism? If it were the government, then it would have to be given far more power than it now has, he said.

If commercial enterprise were to control such a mechanism, Westin said he isn't sure he could see how the mechanism would increase the importance and quality of participation.

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Turing Award Winners Say

Computer Science Empirical Like Traditional Areas

By Don Leavitt
Of the CW Staff

MINNEAPOLIS – Computer science is an empirical discipline similar – in that respect – to many of the more traditional sciences. Each new machine, each new program is an experimental solution to the developers' hypothesis, according to the co-winners of this year's A.M. Turing Award presented by the Association for Computing Machinery at its annual conference here last week.

CW at ACM '75

The award was given professors Allen Newall and Herbert S. Simon, both of Carnegie-Mellon University, in recognition of their whole careers, according to the presenter, Bernard Galler, who noted their impact on current thought in areas such as artificial intelligence and list processing.

At the start of the Turing Lecture, Newall said machines and programs are normally created for preconceived, useful purposes, but "the fact is we can look inside and use them also as means of exploring theories of what is actually happening."

It was that interest in exploration that led Newall and Simon, along with John C. Shaw, to visualize and then develop the concepts of list processing, a procedure using pointers to data rather than the data itself for getting to information that is really needed by the problem to be solved.

Describing how he, Simon and Shaw devised list processing, Newall said they were interested in the processing of symbols, a deliberately ill-defined phrase meaning anything with a physical pattern that represents any idea or piece of information. The ability to work with symbols is a requirement of intelligence, he contended.

The professors' study led to the hypothesis that any system – human, data processing or otherwise – capable of generalized intelligence will be found on analysis to be an instance of a "physical symbol system."

Such physical symbol systems are almost universal machines, and perhaps because of this many people reject the basic hypothesis, he said.

But he traced the background of the hypothesis through symbol-pushing rules, the Turing machines of the 1930s, stored program machines that suceeeded Eniac and on into list processing where the users' contact with his data – his symbols – is completely abstracted from the machine environment.

It may well be, he said, that computer science and psychology have identtical interests, that humans are in fact physical symbol systems and that there should be a science called information processing psychology.

Searching for Solutions

For his part of the lecture – "we couldn't resist the temptation to finally share a podium" – Simon described how searching through possible solutions is an inherent part of the physical symbol systems Newall introduced.

He hypothesized that the solution to a problem can be represented as a symbol structure, and it is the function of a physical symbol system to generate and then progressively modify a set of symbols to reach the desired solution.

Searching for solutions is a sign of intelligence, he remarked, but the amount of searching is inversely proportional to the intelligence being applied to the problem. There are very few programs in any task domain that would be deemed more intelligent than really professional humans working on the same problem.

DP Installations Have Five Lives Nolan Tells SigBDP

By a CW Staff Writer

MINNEAPOLIS – There are apparently at least five stages in the life of a DP installation, Professor Richard L. Nolan of Harvard Business School told a breakfast meeting of the Association for Computing Machinery's (ACM) Special Interest Group on Business Data Processing (SigBDP) here last week.

The stages can be recognized specifically by how the installation handles the classic management concerns of planning, organization and control and the building of an integrated application portfolio, he said. But the point of change from one stage to the next can be seen just by looking at the curve of DP expenditures over time.

The fifth stage is an extension of a four-stage hypothesis Nolan put forth just about three years ago. Though the nature of the first stages has now been pretty well confirmed in his mind, Nolan said the fifth stage's attributes vary with the goals of the installation.

Plotting expenditures over time generally forms an S-shaped curve, and the changes in angle of the curve mark the shift from high cost initiation into DP to rapid extension of services being offered, to imposition of controls and finally to a degree of integration of the entire DP effort with corporate life.

In that four-stage breakdown, the third stage – imposition of control – is when DP management often decided to hold the user accountable for the mess that exists in the application today.

Nolan recognized the fifth stage when he saw that the expenditures curve didn't always flatten out as he had expected. In many cases it paused, but then "skyrocketed" again just as in the first and second of the "old stages," he said.

Real integration of the DP function and the installation's organizational goals will occur during the fifth stage, Nolan said, if its determinant is a desire to get control of data resources, instead of just management of the computers.



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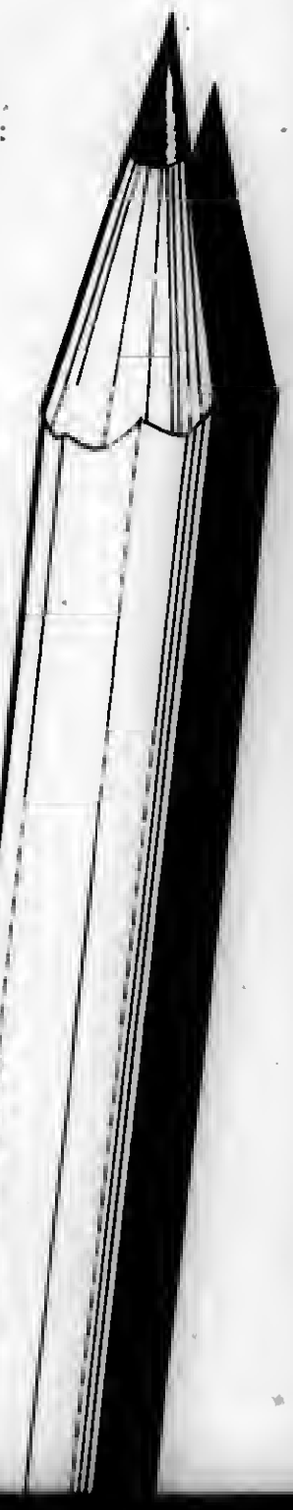
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'Mired' in Work, Pollution Agency Turns to DP Aids

By Ann Dooley
Of the CW Staff

CHICAGO – Mired under a heavy load of paperwork, the Environmental Protection Agency (EPA) is slowly implementing a computer system to help determine whether industries are meeting their pollution-reduction deadlines on time.

The Permit Compliance System (PCS) monitors reduction dates as specified by permit contracts issued by the states, but does not check the amount of effluent poured into the water.

Using an IBM 370/158, the system is geared to give regional and state personnel information on when dates occur so the state can follow up to see whether industries have complied with their schedules.

Carol Foglesong, head of the computer center in the Great Lakes Region, estimated some 10,000 discharge permits were put out by the states in her region. About 1,200 of those are of major concern since they account for 75% to 80% of the industrial pollution.

The system was begun in response to the Federal Water Pollution Control Act Amendment of 1972. This law stated that a discharger, either municipal or industrial, must get a permit to operate from its state. The permit is a contract between the state and the individual for various actions to regulate and reduce the amount of effluent put into the water.

Robert Schneider, Great Lakes coordinator of the PCS, said that until this year there was no centralized method of listing dischargers. Now all date-related information is gathered from the state-issued permits and put into the data bank.

"The system produces a series of computer flags to indicate to the compliance people the interim dates that lead to the final completion of the permit," Schnelder said.

The PCS generates a printout indicating who has a major implementation due each month, and it is then checked to see that the implementation has been met.

An "abortive attempt" was made earlier in Region V to access a general source file which would include everything, Foglesong said.

"It tried to be all things to all people and was just too expensive and had too much information to work with. Our system now is more simple and easy to work with," she said.

Most of the states have their own system and because of their smaller size they are able to handle not just the date-related data, but also the amount of effluent they should be discharging according to their permits. In these cases the EPA is more of a watchdog to make sure the states are regulating the permits on schedule.

A similar system has been used to monitor the status of municipal efforts for some time. As with industries, only the major industrial and metropolitan areas are spot-checked unless a complaint is registered with the state.

If the improvements do not correspond to the computer dates, the EPA can take a series of actions. The first step is to send out a warning to the discharger. If no action is taken, a notice can be issued against the state, since the states have the primary responsibility under the law.

The third step is to refer the matter to the U.S. Attorney, who can collect a civil money penalty from the industry or, as a last resort, impose a jail sentence or a fine of $50,000 a day.

Usually the states take care of the matter at their level and action on the part of the EPA is not necessary.

Tampering Charge Leads to Guilty Plea By Former Policeman

By Nancy French
Of the CW Staff

CINCINNATI – Former Symmes Township Police Chief James Tygrett pleaded guilty to charges of tampering with computerized government records in Hamilton County Common Pleas Court here last week and received a six-month suspended sentence, three years' probation and a $1,000 fine.

Tygrett was indicted last spring for deleting a reckless driving violation from his record through a terminal of the region's law enforcement computer network [CW, March 19].

Until he admitted his guilt under oath, Tygrett maintained his innocence of the charges. He even took a lie detector test in Louisville, Ky., "as proof of his innocence."

During sentencing, Judge William R. Matthews emphasized it would be difficult for Tygrett ever to be employed as a law enforcement officer again, even though the charge was reduced from a felony to a misdemeanor through plea bargaining. (A felony conviction would automatically have disqualified him for police work in this state.)

Ironically, the former police chief lost his job in July when the township's police force was abolished in favor of police services provided by the county sheriff's patrol.

Tygrett is now self-employed, selling electronic games to cafes, sources said.

Five Others Cleared

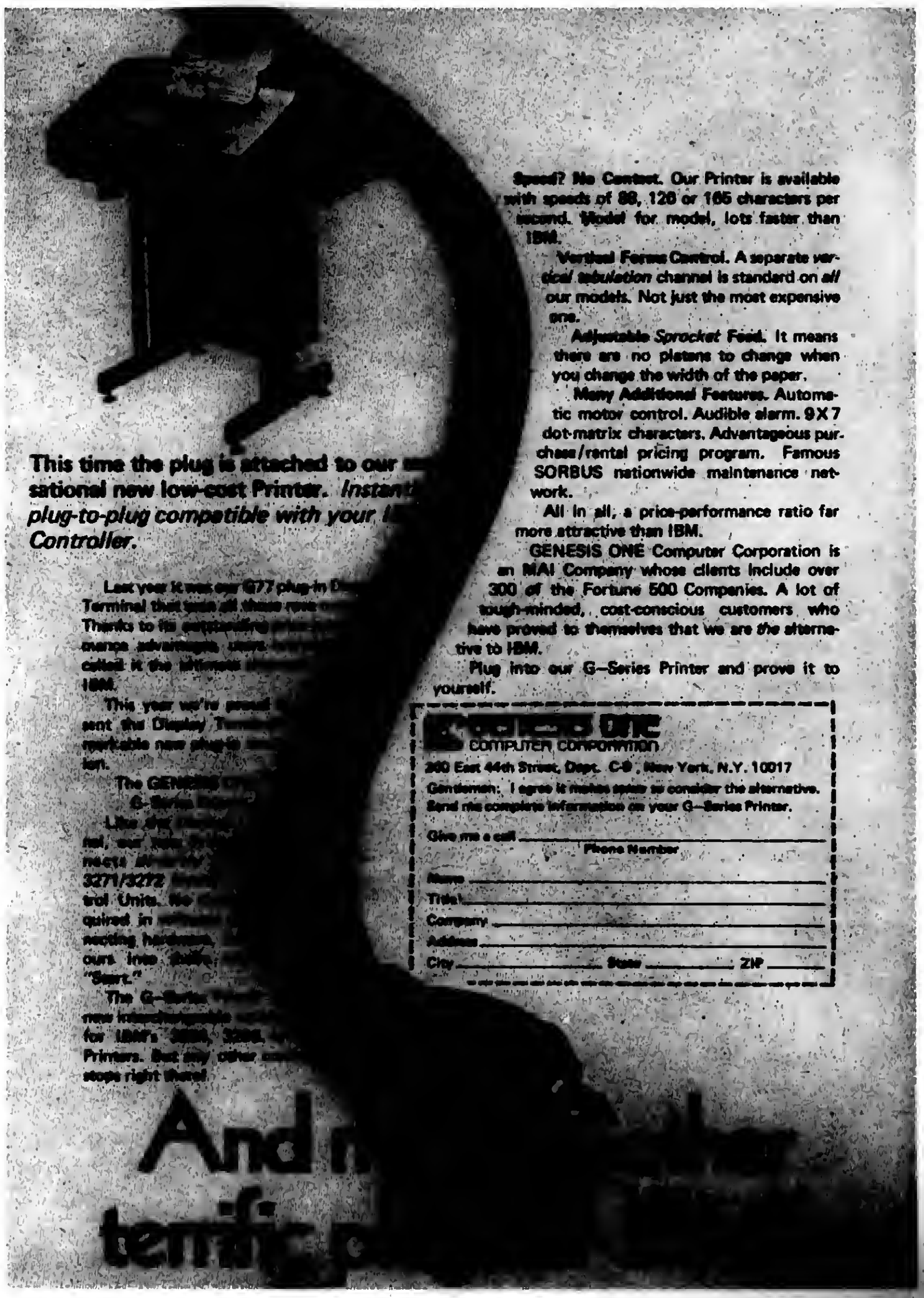
Carl Vollman, assistant prosecutor, said he was "pleased with the disposition" of the case because "we cleared the air of any suspicion that might have surrounded any of the other five people who had access to the computer terminal.

"A supertechnical case like this one is harder to try than a murder case," he added, "because a jury of 12 has to try to understand the function of the computer."

The computer tampering was discovered during routine inspection of a printout at a terminal where the reckless driving offense was originally entered, according to Andrew Atkinson, superintendent of the regional computer center that also serves area police agencies.

The terminal is part of the County Law Enforcement Applied Regionally (Clear), a shared system. As such, the system does not qualify for membership in the National Crime Information Center (NCIC) operated by the Federal Bureau of Investigation.

Had the county belonged to NCIC and observed that agency's standards, the tampering would never have been discovered since federal standards make no provision for security checks of audit trails, Atkinson said.



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Decade of the User Brings End to Closed Environment

By Toni Wiseman
Of the CW Staff

BOSTON – Data processing is in the decade of the user. Printers, terminals, voice response units and other equipment are all geared to teleprocessing and user-oriented functions.

In other words, this decade is a challenge for the DPer because he is no longer working in a closed environment, able to hide behind jargon and technical obscurities, Ted Rhodes of Associated Catholic Hospitals said.

It used to be that the DPer could go to a user's department and tell him if he fills in a form the DP department has designed – hut which the user probably doesn't understand – he will get beautiful results, Rhodes said.

"But the walls of the DP room are starting to come down," he said. "DP is being forced to leave the DP facility as teleproeessing becomes a way of life. The DP manager is no longer in control of the data entry funetion, rather it is spread out into those departments the systems were originally taken away from."

Terminals are breaking open the doors of data processing, Rhodes said. By giving a clerk, supervisor or manager a terminal, you are giving him the power to get computer serviees.

What this means for the DPer is he now has to be more aware of the user's problems and functions. He can no longer hide behind jargon; he has to speak the user's languagc.

User Provides Money

Why? "Because the user is the one who is going to provide us with the money for new systems," Rhodes said. "And if we don't meet his needs, the user will go out and get his own turnkey system whieh he doesn't need any DP knowledge to run, and the data proeessing department is left in the eold."

Rhodes noted that, with teleprocessing, a whole new realm of problems is opening up for the DP departnient.

For instance, if there is a system failure, one can no longer simply go to the head office and report it. Now everyone knows, and within minutes every available phone is ringing wanting to know when the system is going to be up again.

"This means we ean no longer train the user hy simply telling him what code to punch in and then promising him beautiful results," Rhodes said. "We have to make him understand just how sophisticated the system is and that you don't have complete control over it any more.

"If he complains about poor response time at a site 100 miles away, you have to explain about pushing an electron 100 miles down the line, pulling down a program and finding a file before a response can be returned."

"The user has always been the key to the DP industry's growth," he said, "and now we're finally recognizing that what we need to succeed in this, the user's decade, is not management commitment, but user committment."

The industry is going to operate with the same equipment it's had for the last five years, Rhodes said, but it is going to be clustered differently, and the user, not the DP department, is now the focal point of the system.

Managers Should 'Deal With People'

By Ann Dooley
Of the CW Staff

BOSTON – It is more important for managers to deal with people than with computers, Emile Thibault of the Department of Public Safety for Massachusetts, told a group of DP managers here recently.

The ability to relate to others was ranked as the most important quality in a recent survey of managers from more than 130 corporations, Thibault said. The satisfaction of doing good work was ranked highest by 20%, and 17% ranked the contribution made to the company as the next most important, he said.

"People considered the quality of their jobs more important than their salary or job security," he said.

A successful manager has to become more aware of the planning stage, Thibault said. The manager must use long-range, tactical and operational planning to be successful, he said.

Thibault believes that future goals must be considered as well as the less-than-five-year goals of new installations and also daily routine functions. Money, manpower and materials must be managed efficiently and creatively by the manager, he said.

Three Kinds of Managers

There are three kinds of managers, Thibault told his audienee. "One is a dictator, another is a 'great guy' and the third is somewhere in between," Thibault said. The dictator works on a vertical structure. The job gets done just as it is told to get done. Management skills get lost as well as initiative and motivation, he said.

The benevolent manager assigns a team to cover a special project. "This will create a 'gung-ho' group that doesn't have a 9:00 to 5:00 kind of outlook, but a group that is willing to do whatever is necessary to complete its project."

The third group is moving over to the benevolent approach and is still a mixture of both. Thibault said the kind of people and the organization determine which method works out best.

The most effective manager should look at staffing and job assignments and he shóuld delegate authority and coordinate objectives, Thibault said.

"People can be motivated by having their basic needs fulfilled," he said. "People need to feel they're achieving and are being recognized for it. They want responsibility and interesting work."

The manager can help to achieve this, he said, by "explaining the big pieture. A rule to follow is to train people to do a job as well as you, the manager, could do it, and they will push you up the management ladder," Thibault said.

DP Facilities Leading Change in Working Styles

By Ann Dooley
Of the CW Staff

BOSTON – The daily grind of 9:00 to 5:00 is going through a radical change in some computer installations, according to Pat Kinney of the Massachusetts Blue Cross and Tom LeGore of the First National Bank, who explained their revised systems here recently.

The Blue Cross has a three-day work week consisting of a 12-1/2 hour day with an hour off for lunch. "Working on this kind of schedule, the computer staff has hetter morale and there is less fatigue," Kinney said.

The staff is split into four shifts; A and C shifts work from 7:30 a.m. to 8:00 p.m., and B and D shifts work from 7:30 p.m. to 8:00 a.m. with a shift differential of 10%. Every fourth week one shift must work on Sunday. In this way the computer room is kept running six days a week.

Vacation days are similar to the old method, but the computer staff gets only seven holidays instead of the usual 11 days.

The salaries weren't reduced although the staff works less time than the rest of the company. The usual work week is 37.5 hours, while under the new method the week is 36 hours.

When the changeover oeeurred, the staff was not given the option of staying on the old sehedule, and only one person quit because of it, Kinney said.

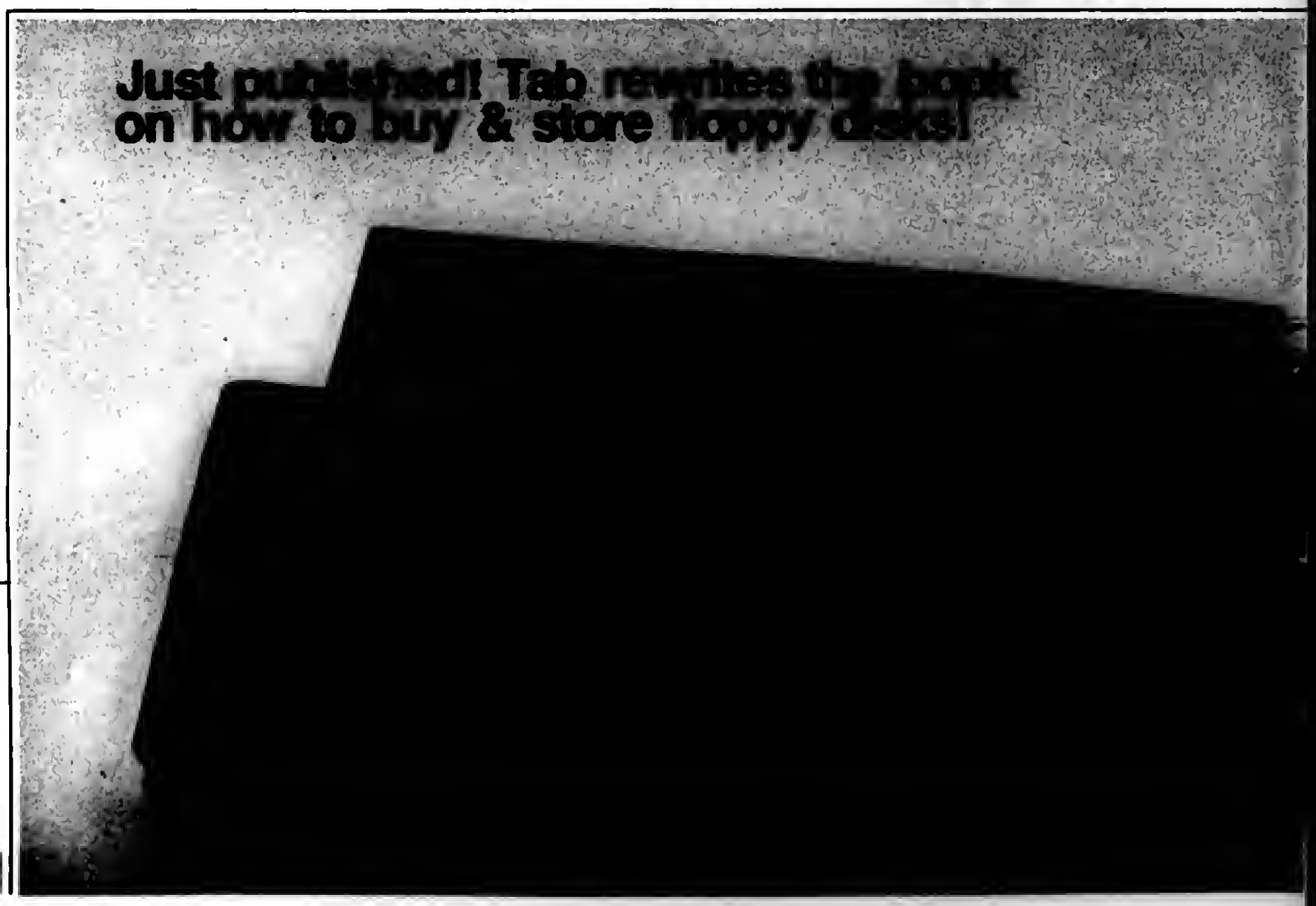
"There were really no problems when we changed; it was a boost to morale. Absenteeism went down because there were less days to get sick and everyone has a mini vaeation every week," Kinney said.

The First National Bank operates under Flextime, Tom LeGore explained. Flextime is a program where the employees work when they feel best able to.

The employee must be at work from 10:00 to 11:00 every morning, but other than that, he can eome in whenever he wants to, LeGore said. A certain mandatory amount of time, called core time, is required of employees, but when they put their hours in is their deeision.

A minimum staff of five people is required to be there at all times and in scheduling it is hard to avoid a front-end load, LeGore said. "Everyone wants to work early mornings and early in the week. No one wants Friday, and Friday afternoon is the worst time of all," LeGore said.

Under this system people are more willing to get to work on time and not leave early, LeGore said. "Our productivity is up 10% and everyone is happy; no one would trade the program for a structured work week," he said.



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After 10 Years

FAA Completes DP-Based Radar Program

By John Hebert
Of the CW Staff

WASHINGTON, D.C. – The Federal Aviation Administration (FAA) has completed its 10-year program of computer-based processing of radar information at all 20 air route traffic control centers (ARTCC) in the U.S.

Commissioning of the radar data processing (RDP) operations at the Miami ARTCC recently marks completion of the second phase of FAA's National Airspace System (NAS) Enroute Stage A program.

This last center with fully operational RDP under the FAA program is "a milestone in the agency's efforts over the years to provide safe and efficient use of the nation's airways," James E. Dow, acting administrator of the FAA, said.

RDP provides for direct readout of aircraft identity, altitude, weather and other flight data on air traffic controller's radar scopes.

Alphanumeric Tags

The RDP information is presented in the form of alphanumeric data tags which represent transponder-equipped aircraft flying in any ARTCC's airspace sector.

Formerly, controllers had to get much of this information through radio contact with the aircraft, write it on plastic markers and move these manually across the screen.

The first phase of the program introduced the use of computers and associated equipment for the automatic processing and transfer of flight data from one center or facility to another. This phase has been in operation at all 20 centers since February 1973.

Each RDP system depends on three major elements: the radar digitizer, developed for FAA by Burroughs Corp., the central computer complex, composed of an IBM 9020 system, and channel display systems developed by Raytheon Co.

The radar digitizer is located at remote, long-range radar sites and includes a radar processor, data receiver group and a random-access plan position indicator.

The digitizer accepts input data from primary search (long-range) radar and secondary search (beacon) systems, and also directly from aircraft equipped with altitude-reporting transponders.

It translates this information into a digital format and routes the information to the computer systems at ARTCC by telephone lines or microwave links.

After the information is received at the en-route air traffic centers, it is processed and correlated with basic flight plan information to provide integrated traffic and weather information for each control sector.

Accommodates Changes

The technique for handling flight plan information from sector to sector along each flight path accommodates changes that occur during flight. The computer system accepts a basic flight plan and calculates the detailed route of flight.

Flight path changes are entered into the system by the controller on an IBM 1052 printer console keyboard.

A continuous flow of radar and transponder data is automatically fed into the computer, as are forward flight plan messages from other centers. The system in Miami is linked to the systems in the Jacksonville, Fla.; New York; and Houston centers. This real-time computer-to-computer link reduces the voice communications required of controllers in passing flight information between various centers.

There are 35 program elements grouped into four subsystems to process digitized data sent from the radar sites. These programs create in memory a representation of the flights and weather phenomena in the area of the center. They also maintain flight identity, heading speed and altitude. Flight progress is predicted to help identify radar signals.

The RDP programs accept and check radar, transponder and weather data. The slant range and azimuth are derived for each aircraft and these are converted to X-Y coordinates. Since an aircraft is monitored by more than one radar as it approaches a different control sector, the programs compare and select the best signal.

The aircraft and weather information logged by the system is sent to a display system which creates individual display images for each controller by selecting specific sector information.

The control center's display systems, composed of Raytheon computer display channels or radar display subsystems, are the final RDP links which give controllers an accurate, three-dimensional look at air traffic.



The IBM 9020 pictured here at the air route traffic control center in Miami will process, track, control and display pertinent data on incoming and outgoing flights.

Radar Display Subsystem

Fifteen of the ARTCC use a computer display channel, and five of the centers use a different system called the Radar Display Subsystem (RDS). RDS incorporates plan view displays, which are identical to the displays used with the display channels.

Computer-generated alphanumeric tags on the controller's plan view displays track flights through the ARTCC sector or control area.

The tags not only identify each flight, but also provide the controller with supplementary data processed by the computer system.

This supplementary flight information is printed on flight progress strips, which are then manually arranged in sequence in racks alongside the radar scopes.

For transponder-equipped aircraft, the alphanumeric tags include a continuous readout showing both the actual and assigned altitude of each aircraft.

The RDP system has been criticized in the past for having hardware and software bugs as a result of an alleged rush to make the RDP system operational [CW, May 7].

"There is no way in which [RDP] is jeopardizing the safety" of airline passengers or personnel, an FAA spokesman said, commenting on the allegations.

Agency Tests Automated Flight Plans

WASHINGTON, D.C. – The demand for flight services is straining current manpower resources and is expected to triple by the early 1980s, the Federal Aviation Administration (FAA) said here recently.

For this reason, the FAA has been conducting pilot self-briefing experiments to see whether computer systems can be used to supply pilots with vital flight plan information in anticipation of a computer-based national briefing system.

The FAA has digested recommendations from some 1,200 pilots who tested the system when the self-briefing experiment was brought to 14 locations around the country last year and has made appropriate program changes.

Seeking Final Comments

The revised briefing experiment has been taken to air carrier and general aviation pilots in Boston, Denver and Chicago areas to get final comments before beginning work on the final design of a national briefing system.

Under such a system, the flight service specialists would serve as backup to the automated equipment and be located at "hub" flight service stations to which the remote self-briefing terminals would be linked.

The terminals consist of a display screen on top of a keyboard. By punching out the appropriate entries on the keyboard, a pilot can retrieve from the "hub" computer essential meteorological and aeronautical information – such as weather maps, weather advisories and notices to airmen (Notams) – and have it displayed on the screen.



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Editorials

Implications of Accountability

The concept of defensive DP raises some ominous implications for the user [CW, Oct. 22]. As put forth by attorney Ronald Winkler, future legal cases involving breaches of DP security will rest heavily on whether the owner of the DP system took the necessary precautions to comply with current legal requirements.

This idea of putting the burden of proof on the initiator of a service has spawned a new term in our society, "accountability." A popular application of this concept is the proliferation of malpractice suits in the medical profession.

But closer to our industry, the consumer groups have demanded their own brand of accountability of the supermarkets that have installed automated terminal systems.

As potential breaches to individual privacy become more serious, the law attempts to prevent them. The result of this attempt at legal protection for the consumer has a profound affect on our society and its legal system.

Professor Kenneth Boulding, director of the Institute of Behavioral Science at University of Colorado writing in the current issue of the *MIT Technology Review*, said we are witnessing a shift from the historic *caveat emptor* (let the buyer beware) to a new *caveat vendor* (let the seller beware).

In the process of establishing legal protection for the consumer, we are bound to get court cases that will have to distinguish between honest mistakes and deliberate evil. And Boulding correctly pointed out that "the sanctions against evil are too severe that they may be applied against honest mistakes . . ."

It now becomes the duty and obligation of those of us familiar with DP systems to show the legislators how data security and privacy can adequately be safeguarded.

Opening the 'Gag' Rule

IBM is currently trying to get the federal judge hearing the government's antitrust case against it to lift a so-called 'gag' rule barring either IBM or the government from talking to the press.

This is strange since the rule was instituted at IBM's request over three years ago.

Many publications – including *Computerworld* – fought against the rule at the time it was instituted, since it effectively prevented those with the most knowledge about the case from expressing their views. The Department of Justice also opposed the move, although not vigorously.

However, the order has now been in effect for three years and IBM's motives for wanting it lifted now should be examined with care.

The firm has a large contingent of public relations personnel and a huge advertising budget that could be used to try to convince the public the case against it is unwarranted.

Using these resources – which far outweigh anything the government could muster – IBM could take its case to the public, skirting the court and building public sympathy for its position.

Apparently the rule suited IBM in the early rounds of the case, but now it is ready to 'unleash its publicity barrage.

The company, however, can't have it's cake and eat it too: The court should not institute orders and then rescind them just to meet the tactical objectives of the firm.

Since the firm wanted the order three years ago, it should live with the consequences now.



'Now All Together, Separately . . .'

Letters to the Editor

Decision to Treat HEW as Agency Based on Some Unreported Facts

The Oct. 1 editorial, "A Sad Commentary," was indeed a sad commentary on the ability of the *Computerworld* editorial staff to fairly and objectively present the facts surrounding the issue – the Department of Health, Education and Welfare's (HEW) treatment of itself as an agency for Privacy Act purposes.

Although the associated article on page 1 partially dealt with the reasons for the decision, it also lacked objectivity and did not include pertinent information.

While internal recordkeeping was a consideration, there were other factors which weighed more heavily in the decision-making process.

Legal guidance from both the Office of Management and Budget (OMB) and the Justice Department opined that the treatment an agency conferred upon itself for Freedom of Information Act (FOIA) purposes would be a reasonable guide for Privacy Act purposes – HEW has always considered itself to be "the agency" under FOIA.

Justice cautioned that, whatever the choice, the practice that followed must not be so invidious as to frustrate the purposes of the act.

While Justice had in mind just the concern expressed in the editorial, the purposes of the act might also be frustrated by the indiscriminate application of the exemption provisions of the act or the approval of routine uses that serve purposes which are incompatible with the originally intended use of the information in question.

Given the existing internal controls on transfer of information by both regulation and administrative procedures, the use of these "loopholes" by the "11 agencies" of HEW are far more serious and potentially damaging.

Treating HEW as one agency has placed the secretary in the position of controlling these and other potential abuses and assuring that the Act is uniformly applied and administered throughout the department.

We have expressly addressed the matter of internal "need-to-know" disclosures through the inclusion in our system notices of a description of circumstances under which such disclosures will be made and by publishing, in the *Federal Register*, HEW-wide standards of conduct which hold the official responsible for maintaining the information accountable for assuring that any such internal disclosures are legitimate.

The specter, in the editorial, of massive exchanges of data between the Social Security Administration (SSA) and the Office of Education (OE) was unfounded. It completely disregarded the existence of SSA's regulation No. 1, which has governed its disclosure practices since 1937.

There are other restrictions on the internal transfer of information which CW overlooked.

More often than not, the disclosures for which we will no longer keep an accounting will be administrative in nature. For example, HEW's central payroll system operated by the Office of the Secretary will not record biweekly exchanges between it and what CW characterized as HEW's "11 agencies." Surely, there is nothing insidious in the desire not to be burdened with maintaining records of this type of "need-to-know" disclosure.

Thomas S. McFee
Deputy Assistant Secretary for
Management Planning and Technology
HEW
Washington, D.C.

IBM Could Desensitize Fraud Data

Alan Taylor's column, "Releasing Statistics Could Aid DP Fraud Prevention," [CW, Oct. 8] included summary statistics on incidents of computer fraud not reported to law enforcement agencies. These statistics were reportedly conveyed by IBM's manager of security, Robert Courtney, and subsequently discounted by IBM.

As director of DP security for my firm, I agree with Taylor detailed knowledge of the specific cases would be helpful in guarding against similar crimes.

However, I must disagree with Taylor's concluding challenge to IBM to release the information they have on these frauds because "it would greatly help everyone and wouldn't hurt you [IBM] either."

First, although information on how these crimes were committed would be helpful to me and others with similar responsibilities, we must recognize that broadcasting such information might also "show the way" for some others to make similar attempts, particularly in light of the reluctance on the part of the "injured" firm to report such crimes.

Secondly, I question Taylor's conclusion that releasing such data would not hurt IBM. Here I must make two assumptions: (1) The injured firms themselves had reasons for not reporting the crimes against them. These probably can be summed up as fear of adverse publicity. (2) IBM's awareness of these cases probably stems from its vendor relationship with the firms and, as such, it properly feels it is dealing with privileged information.

A solution is for IBM to depersonalize the crimes, classify them into categories, describe each category or type, the frequency of occurrence, range and average amount of loss, etc.

This desensitized information could then be incorporated into its security seminars for customers or otherwise made available to customer management.

James A. Schaaf
Detroit, Mich.

(Other Letters on Page 16)

Allan Douglas Maxwell

Just about everybody in our curious tradc has a story to tell about someone who influenced his career: a first contact in fancy electronics, a computer science professor, a friend who enjoyed working in data processing, a boss early in his working history.

This column is about one of the two men who opened doors for me. They didn't shape my personality; like Leroy Brown in the popular ditty, 1 was "mcaner than a junkyard dog" when 1 was in grade school! But by example and by direct help, they steered me into the future. One of the things I hope for most is to have done the same for some of the young men and women I've taught and workcd with.

Why today? Well, it's an anniversary: almost exactly forty years since I put fingcr to calculator button, under the aegis of a remarkable astronomy professor named Allan Maxwell.

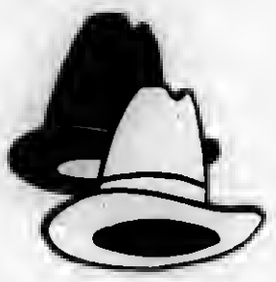
Nearly a century and a half ago, a computational giant named Oppolzer produced by half a lifetime of logarithmic effort (the sort of thing Babbage wanted to eliminate) the canon of solar eclipses for the years up to 2001. It is still used today, albeit with better positions of the sun and moon worked up by modcrn machinery. Oppolzer had one disciple, an enthusiast for asteroid and comet orbit calculation named Otto Leuschncr. Leuschner emigrated from Germany and became head of thc Students' Observatory at thc Univcrsity of California at Berkeley – not to be confused with the Lick Observatory. Leuschner in turn had a young disciple who applied his novel orbit computing algorithms and who came in the late 1920s to Ann Arbor to teach astronomy in his turn.

His name was Allan Maxwell. He was the son of a streetcar conductor in Woodland, California, and with scholarships and hard work he acquired a good Ph.D. and a burning enthusiasm for an old and abstruse part of sciencc: orbit determination and perturbation calculations. He worked first with addition-subtraction logarithms – Leslie Fox, director of the computing network at Oxford, and 1 had a long debate decades ago about which of us should be regarded as the last victim to use them! When 1 met him in the fall of 1935, as teacher of my first professional-level course in astronomy, Maxwell had just purchased with his own savings a fancy new Marchant electric desk calculator. Much later, in the forties and early fifties, he had access to primitive electronic cquipment – the 650 sort of thing. He found it cold, impersonal; to the end of his life he preferred to massagc the intricate calculations of his spccialty with his own hands – with forms and special tables of his own, oftcn rather pcculiar, devising.

He seized on me as a young brand to be saved from the burning of astrophysics and put me to work on a series of orbits of a tiny asteroid just discovered by a Belgian astronomer, which had approached the earth more closely than any other object (except metcors) observed up to that time. Over the next years he taught me a great deal of highly practical, energy-conserving numerical analysis and gave me thc desire for artistic and nonwasteful use of computing power and time that has influenced me strongly ever since. He was greatly concerned with standards: wanted all astronomical computers around the world to use the same symbols and work to an agreed accuracy.

Hc had willingly taken a vow of poverty, as scientists usually had to do in those days; he not only bought his own calculator, but paid his own way to meetings (and mine too, on several occasions). He wantcd a disciple, and 1 was it; Alas! 1 disappointed him by not having one in my turn – at least, not in astronomy.

He was devoted to the idea of accurate and efficient and uscful calculation. He was poised on thc brink of a revolution in methodology that made his dctailed and hard-won skills obsoletc. But his concern for quality, and his dcsire to help young people cnter a world of ideas that hc loved – those things live on.



Herb Grosch

Auditors Should Investigate

Overcharge Errors Can Bring Fraud Dangers to Light

Another case of possible fraud funding which could be checked by alert internal auditors came to light as a result of a $360.47 airline ticket, 016:4459:972:404, sold by United Airlines on Sept. 11 to Don Weimer, a Columbus, Ohio, DP director.

The Taylor Report
By
Alan Taylor, CDP



The ticket, produced by United's Apollo reservations systems in Denver, Colo., included a $42 charge for a night coach flight from Atlanta, Ga., to Columbus, Ohio, on board Delta Airline's Flight 682 on Sept. 14.

This is an incorrect computer output. If Apollo had asked Deltamatic (the equivalent Delta computer system) about Flight 682, it would have found out that 682 doesn't provide night coach service between Atlanta and Columbus. The Deltamatic system, situated in Atlanta a few miles from the airport, knows that Flight 682 provides night coach service only as far as Dayton, Ohio. True, 682 flies to Columbus, but the Dayton-to-Columbus leg is a day flight, not a night one.

Under current rules, night flights can be booked as far as Dayton, but then a separate day flight ticket is needed from Dayton to Columbus. It is, in fact, cheaper to purchase a day-rate coach ticket from Atlanta to Columbus than a night-rate Atlanta-to-Dayton ticket plus a day-rate Dayton-to-Columbus ticket.

Two Mistakes

On the surface, therefore, the sale of the $42 ticket was a mistake which benefitted the customer because he wasn't asked to pay the more expensive day rate between Atlanta and Columbus. However, the flight being booked was not just Atlanta to Columbus, but was Las Vegas to Columbus. Atlanta was just a point at which Weimer changed from Delta Flight 986 to Delta Flight 682.

United's Denver computers, too, failed to recognize this fact and treated the Las Vegas-to-Atlanta flight as a completely separate flight from the Atlanta-to-Columbus one. This second mistake cost Weimer $41 dollars in an apparent overcharge since the night flight coach ticket from Las Vegas to Columbus is $110, while the sum of the night flight Las Vegas-to-Atlanta and Atlanta-to-Dayton tickets is $151.00.

Fraud Danger

What 1 am concerned about is that the ticket, issued by the computerized system which Glen Belden, United Airlines president of computer and communications services on Sept. 10 had assured me was an eminently good system, illustrated a method whereby frauds could be funded.

Potential overcharge situations, like the Atlanta interconnection or the night/day service change at Dayton, can easily be located by insiders, and overcharges that are not detected by customers can, after a suitable interval, be diverted in some way.

Weimer, for instance, would not have known about the overcharge except that his secretary had previously used the office airline guide to cost out the ticket at $319.47 and told him about it.

Internal auditors should be aware of the fraud-permitting situations involved in computer overcharges, not merely on airline tickets but also many other situations. Obviously, auditors' access to the books will allow them to determine whether overcharges are occurring and should result in an investigation as to whether the fraud-permitting situation (unclaimed overcharges) is also occurring.

What to do then is an auditing and management question, but at least routine auditor action would permit those professionals to avoid being called useless in handling the current plague of computer-related frauds.

The auditors' reports, of course, to be effective, should suggest some specific action that could help the situation. In many cases, and certainly in this case, it isn't impossible to do this, even without a detailed knowledge of the system.

Hidden Giveaway

The giveaway to the Weimer overchargc is shown on his ticket in the left-hand box. This column head is simply "X/O," and on the Weimer ticket, the Atlanta to Columbus flight is marked "O." It should have been marked "X," as Atlanta was simply a changeover, not a destination.

Weimer didn't know this, because somcone had decidcd that this box, and only this box out of the 27 labeled boxes on the ticket, would not be explained to United's customers. Presumably the explanation, if one could ever find the person responsible, would be there was no room in the heading for any explanation. This, while technically true, is also technically (from forms-design considerations) an inadequate response.

There may not bc room over the column, but there is room on the ticket. Specifically, there is room available under the farc-calculation box which could be used to explain the difference between "X" entries and "O" cntries (Figurc 1).

Probably there arc bettcr ways that will suggest themselves to you, but all that is important is that there is certainly something that can be constructively suggested by the auditors whcn they find cases of overcharging by computcrs.

Like the situation with the overzealous computer in St. Joseph Mercy Hospital [CW, Oct. 1], the Weimer overcharge illustrated how auditors can follow up on comptutcr errors constructively, giving us all better, more controllable systems which won't be as opcn to fraud as they currently appear to be.

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NAME OF PASSENGER							
X/O	NOT GOOD FOR PASSAGE	CARRIER	FLIGHT	CLASS	DATE	TIME	STATUS
	From						
	To						
	To						
	To						
Fare		FARE CALCULATION					
Tax							
TOTAL		Note: Connecting flights (shown by an "X" under "X/O") are normally cheaper than independent ones. Ask for details.					

Figure 1. In the standard airline ticket design used by United in issuing the Weimer ticket, there is an unused line just under the fare-calculation box. By inserting a message in this area which explains the important but currently unexplained "X/O" column on the left of the ticket, the impact of potential errors leading to overcharges could be reduced. One possible form of the message is shown above.

Letters to the Editor

PL/I Preprocessor Offers W-2 Solution

Although I agree with H. Richard Winkler about the Internal Revenue Service's changes in the layout of the W-2s each year being a nuisance [CW, Sept. 24], we have found a solution.

We use the PL/I preprocessor to make the changes to the W-2 print program. All the programmer or clerk has to do is to code up a W-2 print format form.

This form contains the spaces for the data name or literal you want to print (Social Security number, gross amount, etc.), line number, column number and the format of how it should be printed (ZZ9, XXXXX, etc.).

This coding takes about 15 minutes to do and no executable instructions are changed by the programmer. The form is then keypunched and the deck of cards are compiled into the program. The PL/I preprocessor generates the new executable instructions.

Since we have to live with the W-2 print layout problem year after year, we tried to make the best out of it by programming around the problem.

Sam Becker
Senior Programmer
Foods Division
The Coca-Cola Co.
Houston, Texas

IDS Oversight

In the recent Special Report on data base management systems (DBMS) [CW, Sept. 24], it was stated that the report was a mix of "tutorial" material and user experience.

The introduction to the report said "several packages are generally regarded as the major DBMS offerings: IMS, Total, IDMS, System 2000 and Adabas" and "Burroughs, DEC, Univac and Xerox all offer DBMS."

Nowhere in the entire 16-page report could we find any reference to Honeywell's product, the Integrated Data Store (IDS), beyond the oblique reference to it in the review of Ian Palmer's latest reference work that "General Electric (now Honeywell) released software of this type as early as 1965."

And, in spite of the fact that the British National Computer Centre survey of the DBMS users in the U.S. reported the reactions of several IDS users, your reviewer did not mention IDS at all while mentioning at least five other DBMS products.

Certainly the fact that IDS has today more than 450 users around the world at least qualifies Honeywell to be listed as a vendor which offers a DBMS, although we must candidly confess we cannot understand why CW did not categorize IDS as a "major DBMS offering."

May we respectfully ask whether the omission of any reference to IDS was simply an oversight?

Floyd E. Johnson
Manager
Database Product
Requirements Planning
Honeywell Information Systems
Phoenix, Ariz.

The omission of IDS was an oversight. IDS will be covered, however, on our ongoing "Data Basics" page in the Software & Services section. Ed.

Move Not 'Smooth'

I am writing in reference to the article about the John M. Smythe Co.'s conversion to Cincom Systems' Total [CW, Sept. 24].

The fact that DP manager Joseph Stacey did not have major problems can probably be attributed to two things – he knows his job and he used the Cincom package and not IBM.

To say, however, that the installation was "smooth" was somewhat contradictory, since on two pages later was a headline revealing it took 14 long months to do the job!

I am not being critical of Stacey, as I'm sure he did well with what he had. However, I hope top management did not see that issue of *Computerworld*.

In that same issue, the results of a DBMS survey were published. One user was quoted as saying, "It takes twice as long with people of a higher skill level to bring up an MIS system than a Burroughs'."

This means that if it took Stacey 14 months to bring up his system, it probably would only have taken seven months with Burroughs DMS II.

How much was seven months of nonproductive overhead worth to John M. Smythe Co.?

Lou Hernandez
Los Angeles, Calif.

Unfortunately, reader Hernandez missed several points. Smythe uses Cincom Systems' Total and not IBM's IMS, the specific DMBS the user in the survey article compared to Burroughs' DMS. We have no data on how a Total implementation compares with a Burroughs-based effort in time or skill required.

In any case, Stacey and his small staff were not dedicated to Total for 14 months. As the article noted, they continued development and maintenance of nondata-base applications in addition to bringing up Total. – Ed.

Identifying Grosch

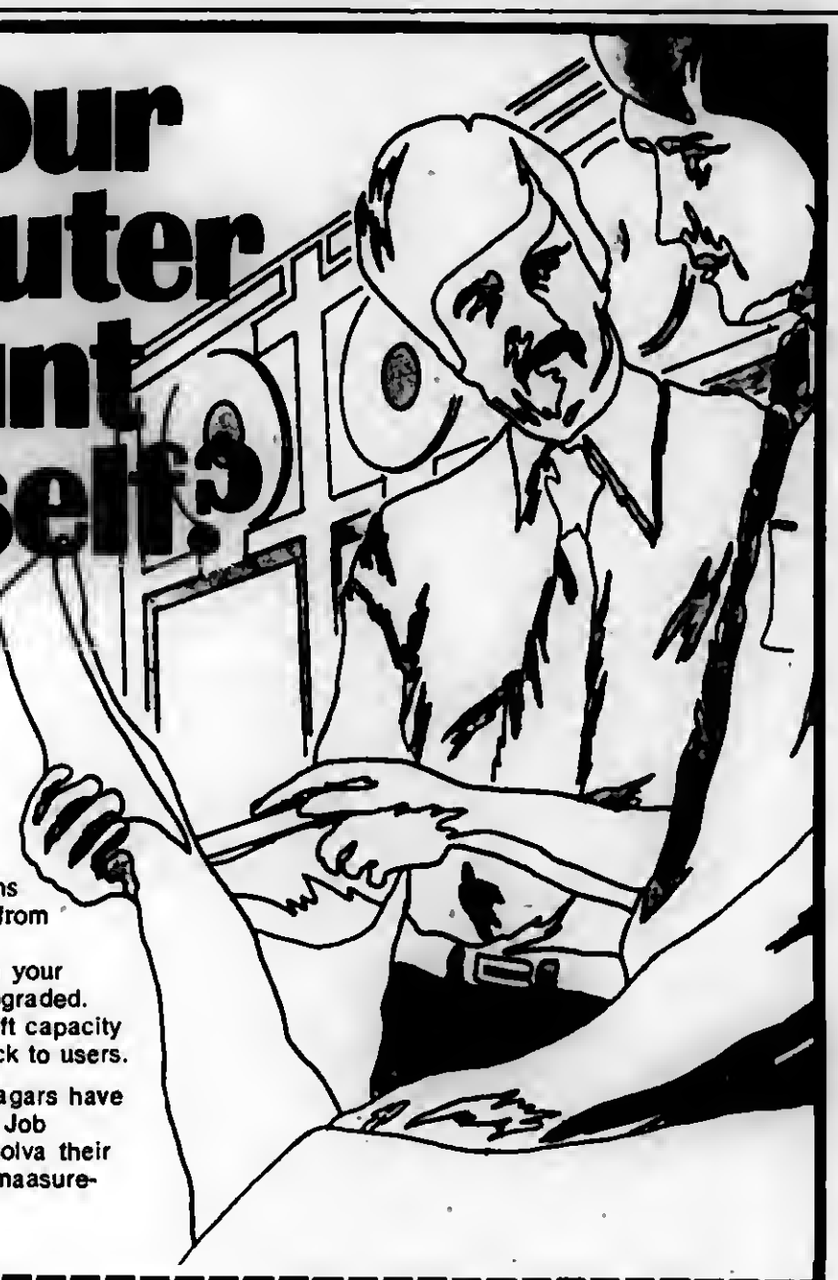
In the Sept. 24 issue, Jerry L. Poppenheimer asked the rhetorical question "Who's Herb Grosch?" One answer may be found in William Rodgers' excellent book, *Think*, wherein he discusses Grosch as follows:

"Besides being a scientist and joining the early colony of IBM men with doctorates, he was the first and only person with a beard hired by the company in Watson's lifetime. To compound matters, achieving more distinction than a man ordinarily pursues, Grosch went into the intellectual circle of IBM scientists twice: first under the reign of old Tom Watson, and second in response to a directive from his heir, Tom Jr. – and was fired both times."

To save potential future embarrassments, Poppenheimer may want to read the entirety of Rodgers' book, which not only gives a history of one of the larger computer manufacturers, but the historical roles played by men with names such as Watson, Aiken, Eckert, Von Neuman, etc.

Dean W. Lawrence
Vice-President
L&A Computer Industries, Inc.
Overland Park, Kan.

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EDP/PR Survey Finds

CPE Concerns 'Fair Percentage' of Top Management

By Don Leavitt
Of the CW Staff

PHOENIX – A "fair percentage" of top DP management is concerned about computer performance evaluation (CPE), at least to the extent of receiving some reports regularly, according to a recently completed survey.

More than half of 206 users told *EDP Performance Review* (EDP/PR) hours of operations, user billings, CPU percent utilization and downtime are among the measures reported to their top DP executives. Beyond that, on the average, about one-third of the DP managers' managers are also receiving some form of performance reports.

In his summary of the survey results in the current issue of EDP/PR, editor Phillip C. Howard noted tools and techniques for measurement "exist, but need improvement. Manufacturers need to add certain types of measures to their accounting data.

"Vendors of [hardware and software] monitors and accounting packages need to concentrate on further reducing their outputs into more understandable and meaningful forms," he went on.

Finally, "suppliers and users alike can best serve management by searching for new and better ways to express theoretical systems capacity, to track usage against capacity and to enable the prediction of future systems resources," he concluded.

The 206 responses came from "about 4,000 questionnaires" originally distributed, and Howard was disappointed with the low level of reaction. The results "represent, at best, generalizations of real world activity," he thought, and may not be statistically defensible.

In total, 358 systems were covered by the responses. The number of multiple-system sites combined with the preponderance of larger systems was no surprise to Howard. Though CPE efforts can be useful in smaller shops, he conceded "many of the activities . . . are not economically justifiable."

It was also no surprise to Howard that job accounting data ranked as the primary measurement tool, with 93% of the users reporting some use of such data.

Software monitors are used by 51% of the sites reporting, which Howard said represented a "slight gain" over the percentage that used such tools when EDP/PR summarized another CPE survey in March of 1974.

The number of shops running CPE activities has grown in the year and a half since the 1974 survey, so the growth is actually greater than the 5% shown statistically.

Hardware monitors are used by 32% of the respondents in the current poll. Although this is a 7% decline from the March 1974 figures, Howard noted the actual number of monitors has in fact grown in that time span.

Extensive Questionnaire

Howard's survey vehicle was an extensive questionnaire covering everything from configuration data and tools and techniques used to the types of output – if any – presented to different levels of management.

To keep responses pertinent, he devoted a full page to 32 specific measures of performance under six general categories. Respondents were asked which measures they used, what the source of the data was, at what frequency the data was reported and to what levels of management.

The final section of the survey form asked questions designed to elicit specific information on the limitations of current measurement capabilities.

Requests for subscriptions for EDP/PR ($36/year) and copies of the October issue, in which the survey is covered, should be addressed to Applied Computer Research, Suite 298, 8808 North Central Ave., 85020.

Itel Devises Way to Put Vsam on 360s

SAN FRANCISCO – Users of IBM 360s are gaining more system capabilities supposedly meant only for 370 sites. Now, taking a page from one of IBM's most respected publications, Itel Corp. has devised the means of using Virtual Storage Access Method (Vsam) files on almost any 360 with 512K or more memory.

That such "downward compatibility" was possible was suggested last year by D.G. Kecher and J.O. Lacy, who wrote in the *IBM Systems Journal* that "although Vsam has been designed for use with virtual storage operating systems, it may also be used with all of the OS/370 [sic] operating systems."

The specific keys to use of Vsam under OS/MVT Release 21.8 on 360s lay in Itel's previously developed 3330-type disk support on 360 channels and the company's coding to simulate 370 instructions on the earlier machines.

By adding a paging mechanism called Virtual Linkage Subsystem (VLS), Itel now is able to use IBM's own Vsam logic – unmodified – on the 360s. That approach is important, Itel stressed, since it assures continued use of the high-powered access method on the 360s, regardless of how IBM may change its coding.

There are at least five basic reasons for 360 shops to consider using Vsam, according to Itel. Vsam already includes functional enhancements over old access methods, and these will certainly be extended. Overall, Vsam provides improved performance, Itel added.

With Vsam on a 360, the user has VS compatibility, and therefore backup, without necessarily having two 370s. Important to the DP staff, in Itel's view, are the thoughts that it will avoid technical obsolescense and have easier conversions whenever it finally does go to a 370 VS environment.

An extension of OS/360, VLS facilitates the execution of large programs in a small real memory area. Under VS, Vsam catalog management and Open/Close/End of Volume routines would require 240K on virtual storage; under VLS, they use only 20K of real memory, Itel claimed.

OS/Vsam is currently running at Itel's Palo Alto facilities and is scheduled to go into Beta testing at a user site still to be selected in January. General availability for users with at least some hardware from Itel at a price still to be determined is expected late in the first quarter of 1976.

Although 2314 and 3340 disk systems are supported under Itel's 370-on-360 capabilities, users must have at least one of Itel's 7330 disk drives for VLS, a spokesman noted from One Embarcadero Center.

Tymshare Offers 'Magnum' for Relational DBMS

CUPERTINO, Calif. – The Magnum information management system now available on Tymshare, Inc.'s remote-computing network is built on "relational" concepts which the vendor believes will be the basis of "an entire new generation of data base management systems [DBMS] and services."

The relational approach to DBMS design has been the subject of much research and experimentation in recent years. When properly implemented, it gives the user a dynamic view of data with relationships defined "on the fly" rather than before application programs are written.

It isn't necessary for the relational DBMS user with Magnum, for example, to know or care how the computer – in this case, a Digital Equipment Corp. Decsystem-10 – executes instructions to access or change items in the data base.

Working with simple two-dimensional tables showing how a pair of items are related, the user can create any relationships required with a set of eight Magnum commands, Tymshare said.

The user overlays, in effect, the simple tables so the common item type in each drops out and the previously undefined relationship between the remaining types becomes obvious.

The specification of the mechanism to bridge the gap between data and the user's requirements is stored outside the user's programs (and outside the data base, in that no "pointer" records are used) in the data base description. System software applies these specifications when compiling user data accesses.

With an approach such as that used in Magnum, savings in maintenance work – on both data base revisions and reprogramming – are "significant," according to the vendor. Tyipcally, half of an installation's time and resources is spent in maintaining a conventional DBMS, a spokesman estimated; with Magnum, the level of effort drops to 15%, he said.

Magnum also cuts sharply into the time and effort needed to get a data base designed and operational, he added.

Since Magnum has been implemented on the Tymnet network, users have gained the data communications facilities that are often desirable, without the headaches of maintaining lines and equipment, the spokesman added from 20705 Valley Green Drive, 95014.

Correction

The Terminal Application Processing System (Taps) [CW, Sept. 10], was developed and is maintained by Decision Strategy Corp., 2 W. 45th St., New York, N.Y. 10036.

Distributor of the package in New York, New Jersey and Connecticut is American Computer Software Clearinghouse, Inc., 440 Park Ave. South, New York, N.Y. 10016.

Distributor of Taps beyond that three-state area is International Systems, Inc., 150 Allendale Road, King of Prussia, Pa. 19406.



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'Abanal' Controls Abend Dumps

BEDFORD, Ohio – The Abend Analyzer (Abanal) now marketed by Operating Systems Services, Inc. (Ossi) was designed to eliminate most IBM 360/370 OS abnormal termination dumps and to assist in solving the problems that cause them.

Developed by Tomark, Inc. of Seven Hills, Ohio, Abanal is said to diagnose more than 160 unique Abend situations. These include program data exceptions, data checks and "almost all" current access method (including Vsam) file problems, according to Ossi.

No modification in OS/MFT, MVT, VS1 or VS2 environments are required – except for two minor JCL changes – and changes between these systems can be made without changes to the user's application programs.

When a call to the IBM Abend routines is intercepted, Abanal loads and deletes routines to diagnose the problem. The Data Management Control Blocks for all Open files are formatted and printed as an additional aid, Ossi noted.

The System Completion Code is compared against the installation-defined Dump/No Dump table to determine if a dump has been requested for the situation that has been encountered.

Programs not using Abanal's dynamic load feature or the optional Call statement merely follow IBM's routines if an Abend occurs, the marketer said.

Beyond the formatting of control blocks and support for variable Dump/No Dump tables, Abanal includes a dynamic "Compile, Link and Go procedure for testing under Abanal and elimination of 'silly' Abends such as 'Program Not Found, Out of Core and Missing DD cards,'" it added.

Written in Assembler, Abanal uses about 750 bytes for its interface routine and linkage. An additional 2,500 bytes are dynamically used and then returned to the system before the IBM termination routines are brought in.

The package is available for $5,700 or $158/mo from Ossi at 210 Best St., 44146.

APL Net Backs Users of 5100

BETHESDA, Md. – A library of application programs on the APL-Plus remote-computing service offered by Scientific Time Sharing Corp. (STSC) is being made available to users of the IBM 5100 portable computer, according to an STSC spokesman.

The programs and APL-based utility routines will be accessible to a 5100 used as a terminal linked to APL-Plus or as packages for use on a 5100 in stand-alone mode.

Initial offerings, the spokesman said, include financial analysis library, a plotting package and a programming "tool kit."

Although the recently announced 5100 supports either APL or Basic, there are features in its design that indicate its prime role is as an APL unit; in that role, it seems better than anything comparable in price on the market now, the spokesman said.

By trying some of the programs while using the 5100 as a terminal linked to APL-Plus, a user inexperienced in APL can gain a knowledge of the language and turn to STSC technical personnel for support before bringing the program in-house for a stand-alone operation, the vendor suggested.

Support, including the APL seminars STSC runs periodically in various cities, will continue to be available to the user who does move the software onto his own in-house 5100, the spokesman added.

Use of the APL-Plus facilities while the 5100 is linked to the service will carry the company's normal rates for time and resources.

APL-Plus is accessible from 80 metropolitan areas across the country. The vendor is based at 7316 Wisconsin Ave., 20014.

Users Have Choice Of 'IQ' Packages

WALTHAM, Mass. – Users of Honeywell 6000 or IBM 360 and 370 systems may now be able to choose just how much report-writing support they want by utilizing any of three versions of the Information Quick (IQ) package from The Management Group, Inc. (TMG).

All three versions are said to include "extensive" default values, which allows nonprogrammers to learn the system easily. Headings and column locations, for example, are managed by the system, although advanced users may override these and other defaults.

Either detail or summary reports can be generated by all versions, and all have the ability to define and redefine fields and to handle multiple-record types and hierarchies, TMG said.

All three versions operate in load-and-go mode, the vendor added.

"Unlimited" calculation and selection capability is available, including the ability to PERFORM a series of predefined steps based on selection criteria test results. A file/record definition dictionary is also included in all IQ systems.

High-IQ, the most powerful of the line, supports matrix reporting, table lookup operations, multifile input and output.

Both High-IQ and Average-IQ, the next in the series, can be interfaced with a specific data base application "relatively simply," the spokesman added. In general, however, Average-IQ is less powerful, not having matrix-reporting, table lookup or Occurs clause capabilities.

Average-IQ and Low-IQ are upward-compatible with the top of the line but again, Low-IQ is less powerful than the others.

IQ is written in ANS Cobol and runs in 55K. The package costs are in relation to their capabilities, with High-IQ at $15,000, Average-IQ at $12,000 and Low-IQ at $9,000.

TMG is at 393 Totten Pond Road, 02154.

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On-Line Access System Keeps This Firm 'On the Ball'

OAKLAND, Calif. – Ball Computer Products has installed a minicomputer-based on-line system to control manufacturing operations at its main office and plant here.

Developed by HMS Limited, an Oakland software firm, the system is used for inventory control, material requirements planning and purchase orders.

All data is entered on-line via CRT terminals from source documents. These terminals are also used to retrieve up-to-date information on stock items, bills of materials, vendors and purchase orders.

A unique aspect of the installation is its implementation; HMS wrote the system in Data Access System Language (Dasl), a high-level approach it created specifically for coding such on-line, transaction-oriented turnkey systems.

Ball Computer Products was faced with an expanding product line requiring complex bills of materials. The product line, including minicomputer systems, peripheral subsystems and OCR equipment, is made up of over 5,000 distinct parts, all of which must be maintained in inventory. Manufacturing some items requires from six to eight levels of subassemblies.

Ball did not have timely information of stock levels and was unable to reserve stock for scheduled future production. The frequent changes in bills of materials resulted in extensive paperwork to adjust stock requirements and order components with sufficient lead time to meet production schedules.

Search for Solutions

Jim Hunter, Ball's operations manager, began a search of available solutions, including service bureaus and in-house equipment.

"We specified an on-line system with data capture right at the source," he said. "That was the only way we could have accurate stock status information at the instant we needed it. The HMS system offered the most power for system cost.

"Its use of Dasl meant we could have a flexible system customized to our requirements without waiting. The inventory control portion was up and running in four weeks. Bill of materials, purchase orders and reservations were developed with similar speed," he said.

HMS saw the need for generalized language for writing transaction-oriented systems after developing a data entry and validation system to control stock inventory at the Pacific Stock Exchange's Pacific Securities Depository.

"Many of the techniques we developed for the exchange system are generally applicable to all manner of business and manufacturing situations," Philip Henningsen, vice-president at HMS, explained.

"At the same time, he noted, each company has numerous unique aspects in the way it handles its business, so a canned program is not always particularly useful.

"With Dasl, we have a formal language structure and some 200 interrelated, precoded routines that can be knit together to do productive business-oriented data processing. The user obtains the benefit of a custom turnkey system without the cost."

Dasl creates systems in which all data bases are on-line, capable of immediate inquiry and update. Data is entered via a CRT from source documents. Extensive validation displays errors immediately to the operator for correction prior to posting.

CRT operations are in "page" mode. The operator keys in the function to be performed and the appropriate page format appears on the screen. Batch control of entries is also provided.

There is no limit to the number of functions available. Separate functions can proceed concurrently at different CRT terminals, or the same function can be in use independently at several terminals.

Ball uses about 30 functions, or transaction types. For inventory control, transactions include issuing items from stock, entering items to stock, adding and deleting part numbers, inquiring on part number status, producing partial or complete inventory listings, extracting histories of past transactions and producing an order review list of items which have reached the minimum stock level.

The bill-of-materials subsystem performs transactions on a complete bill of materials rather than just one part – inquiring on the availability of parts for 10 OCR machines, for example, or producing a picking list combined for more than one level for a bill of materials with cost information.

The system will also issue a quantity of all items listed on a bill of materials, add new bills or new items to a present bill of materials and allow a part number or other information in the bill to be changed.

The purchase order subsystem allows entering a new order, display of previously entered orders, a report of orders with dollar value and reports on open and overdue orders. Lead time information on file is used to report which items should be ordered to meet production schedules and maintain minimum stock levels.

The reservations subsystem is used mainly to allow time-phased purchasing against a production schedule.

HMS has implemented the system on a Ball Computer Products minicomputer with 32K words of core, a 2.9M-character cartridge disk drive, magnetic tape drive, three CRTs and a 120 char./sec printer.

Ball expects that it will be able to expand its system, incorporating such applications as sales analysis, accounts payable, accounts receivable and general ledger, with a minimum of effort.

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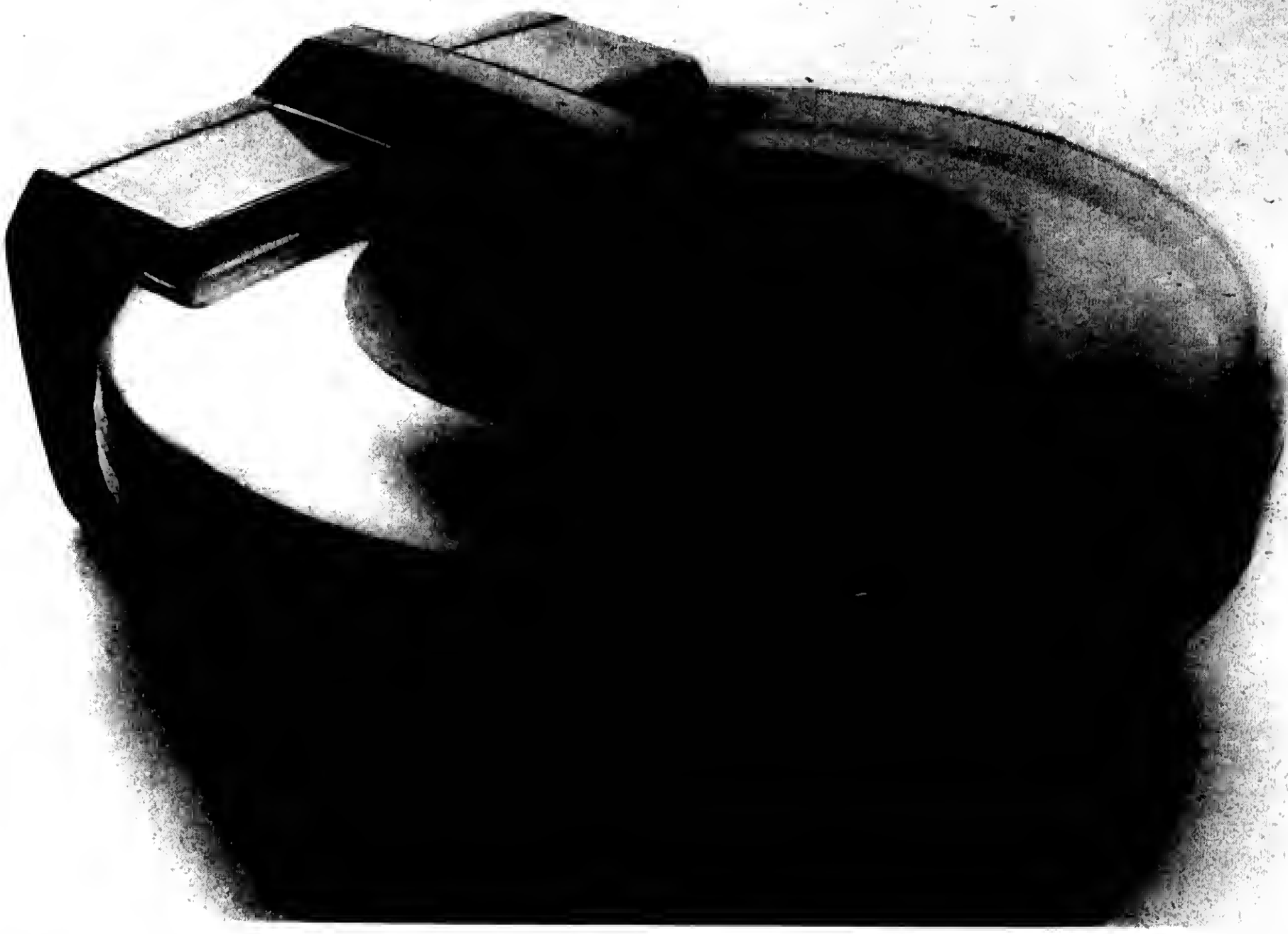
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COMMUNICATIONS

For Either 360s, 370s

Package Lets Users Attach IBM 3705 to Dual Hosts

By Ronald A. Frank
Of the CW Staff

MANHATTAN BEACH, Calif. – Users can attach a single IBM 3705 front end to two 360 or 370 CPUs by combining IBM hardware with software from Comm-Pro Associates.

The IBM hardware changes are included as a request for price quotation (RPQ), or nonstandard, offering that is only available without the software to make it work. The RPQ allows the user to operate two channel adapters on the same 3705.

In order to implement the hardware capability, the user must have a second storage frame, a second Type 1 channel adapter and a second attachment base, according to IBM.

Once the necessary hardware has been acquired from IBM, the user can get the Multi-Host Support (MHS) package from Comm-Pro. The package requires approximately 2,000 bytes of 3705 storage and contains line-switching logic that allows incoming lines to communicate with either of the two host CPUs.

In the event of a host failure, lines can automatically be rerouted to the host which is still operational.

During off-hours, the teleprocessing load can run on one host without the need for mechanical line or channel switches, the company said. This reportedly eliminates a teleprocessing monitor which can require up to a half-million bytes of real core.

No hardware or software changes are required in the dual hosts and "only minor changes" are required in the 3705 Emulator Program, according to Comm-Pro.

The MHS software is available in three versions of a lease-only basis. The PP01 package includes manual switching of lines and costs $200/mo; the PP03 package adds code conversion for IBM 2740 and 2741 terminals and costs $230/mo; and the PP04 package includes user-initiated switching of CPUs from remote terminals.

With the latter capability, the terminal operator calls out the desired software system and the terminal is then connected to the proper CPU subchannel. This package, which costs $450/mo, also allows 3705-generated messages to be sent back to the terminal if all subschannels are in use or one of the CPUs is down.

The MHS software is available on a 30-day trial basis and Comm-Pro will provide continuing support "in the event IBM software changes affect the operation of the package." The firm is at 638 14th St., Suite 700, 90266.

The IBM RPQ costs $249 on monthly rental, $212/mo on the 24-month Extended Term Plan or $9,792 purchase. The RPQ number is EF 6241 and further information is available from local IBM branches.

'Grasp VS' Backs 3741 Terminals

SAN MATEO, Calif. – Software Design, Inc. (SDI), has expanded Grasp VS with teleprocessing support for the IBM 3741 terminal.

Grasp VS will support the 3741 in either of two modes, data communications or full remote job entry (RJE).

Using the data communications mode, the company said, users can transmit data to and from a remote location with the full computer setup and job control responsibilities remaining in-house at the DP site.

On the other hand, full RJE mode is also available for users who want to use the 3741 for applications such as program development, which requires more control at the remote terminal.

The diskette terminal may be hooked up to the central computer either by dial-up or by private lines, SDI said. Grasp VS supports either type of connection with "virtually no operating differences."

Additional user programming is reportedly not required. Once a program is working with a normal card reader and printer, it will work unaltered with the diskette terminal, SDI said.

This means existing in-house systems can be transferred to remote operation without programming changes and new systems can be completely developed, tested and debugged in-house, a spokesman explained.

Transmission to and from the 3741 includes both data compression and record spanning as standard features. The result is said to be maximum throughout and minimum line costs.

The software is available now and costs $24/mo for the remote terminal capability plus $24/mo per CPU port. The firm's address is Box 5854, 94402.

EFTS Seen Creating Retailing-Banking Competition

NEW ORLEANS – With electronic networks and terminals that provide many self-service banking features appearing in both retail and banking locations, the two industries are likely to become competitors for providing customer services, according to William S. Anderson.

Anderson, chairman and president of NCR Corp., made the remarks at the 17th annual EDP and Data Communications Conference of the National Retail Merchants Association (NRMA) recently.

As keynote speaker at the four-day conference, Anderson told the retailers that, with the advent of electronic funds transfer systems (EFTS), banks now realize the retailer's customers "can also become their customers.

"And," he added, "it can also work the other way."

Integrating store operations with EFTS of the future raises many questions for the retailer, Anderson said. These include the impact on the retailer's credit business, costs of debit-card transactions and sharing in the benefits of electronic funds transfer.

Anderson strongly endorsed the OCR-A voluntary retail identification standard adopted by the NRMA for use in marking merchandise tags and other control documents. OCR-A can be read by scanning devices and, according to Anderson, will contribute to a more efficient retail industry because it makes possible the automatic and accurate capture of key data.

"Most important of all," Anderson said, "for consumers OCR-A can mean new levels of convenience, time savings and improved accuracy – all of which can make shopping the enjoyable experience it should be."

He said NCR would continue to provide and support equipment using the color bar code and other proven identification systems now in use, "even though our future development efforts will be devoted to OCR-A now that it has become the industry's voluntary standard."

In commenting on general merchandise retailing's OCR-A standard and the Universal Product Code (UPC) developed by the food distribution industry, Anderson said OCR-A should be judged on its own basic merits rather than on its compatibility or lack of compatibility with UPC.

He warned retailers to be prepared to deal with "increasing government overregulation and encroachment" as the electronic retail systems of the future evolve.

Restrictive price-marking legislation has been introduced in Congress, in many state legislatures and numerous cities, he noted, even before supermarkets have fully tested the new UPC scanning systems and "before the shopping public has had an opportunity to decide whether it likes them."

Synchronous Modem Allows Use of Asynchronous Devices

FORT WASHINGTON, Pa. – The Tele-Dynamics Division of Ambac Industries has added a feature to its 2,400- and 4,800 bit/sec modems that enables asynchronous terminals to be used on a synchronous line.

The asynchronous-to-synchronous interface will allow users with asynchronous terminals or minicomputers with asynchronous data ports to run their equipment on synchronous lines, thus taking advantage of higher transmission speeds, a spokesman said.

When high-speed asynchronous terminals such as CRT terminals are used with synchronous modems, there is the risk of losing data when their speeds are not identical. The asynchronous-to-synchronous interface buffer option on medium- and high-speed modems will correct for this situation by converting the terminal's serial data stream to parallel words and storing the data in a 48-bit memory buffer, a spokesman said.

The output section of the buffer then accesses the memory and shifts the words out serially under control of the modem clock signal, he added.

Should the modem run faster than the terminal, the buffer inserts extra stop bits into the data stream to compensate for the difference in total bit throughput. If the terminal runs faster than the synchronous data stream, the buffer's memory will handle a packed block transmission of 200,000 bits (20,000 characters).

The two modems equipped with the interface are the 7201, which is Bell 201-compatible and costs $1,100, and the 7208, which is Bell 208-compatible and costs $3,500.

The interface feature can be added to some modems already installed and the capability by itself costs $200, the spokesman said.

Tele-Dynamics is at 525 Virginia Drive. 19034.



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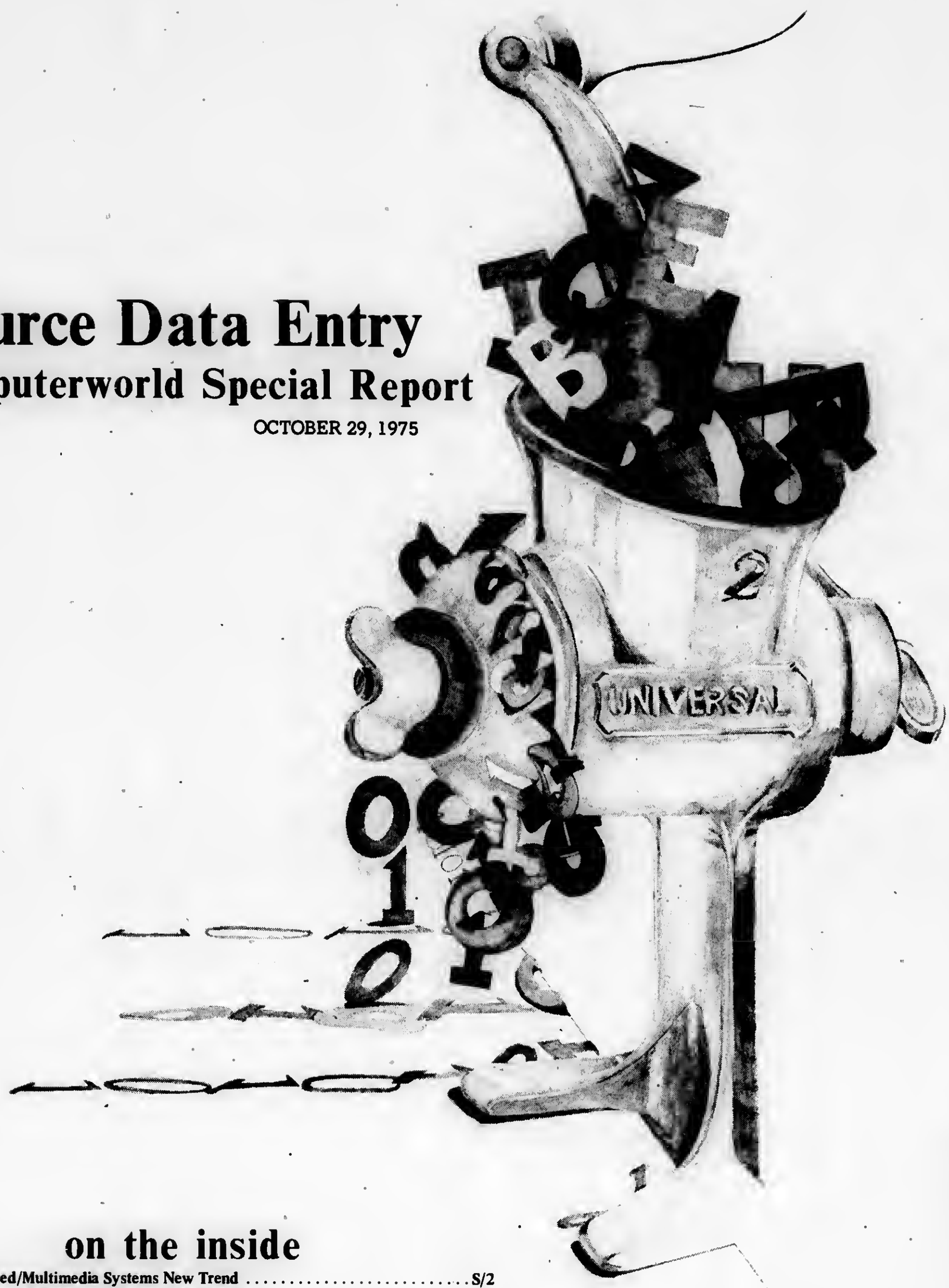
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Source Data Entry

A Computerworld Special Report

OCTOBER 29, 1975



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This special report was prepared under the direction of Victor J. Farmer. Cover art was done by Cynthia L. Kintzer.

Inputting on Mixed/Multimedia Systems New Trend

By Jan Snyders
Special to Computerworld

Data entry equipment has taken on such a wide area of application today one needs a score card to tell which can do what.

It encompasses areas such as optical character recognition (OCR), mark sense, Micr, point of sale, industrial and multipurpose data collection, financial information systems, multimedia systems and key-to-storage.

Of these, key-to-storage is the most widely discussed for everyday applications. But even in this area we are witnessing a new trend.

According to the latest *Auerbach Reports*, there are more and more "multimedia" systems appearing on the scene. Basically, these systems started out consisting of a marriage of key-to-storage with OCR. Later, systems were designed to handle Touch-Tone data entry and word processing by mixing various types of equipment with key-to-storage.

The idea of multimedia systems seemed rather dormant until July of this year when IBM made one of its "major" announcements. This was the announcement of the 3760 dual key-entry station at the same time it announced the 3790 communication system/data entry configuration.

What this indicated, at first appearance, was that IBM enhanced its communication system. Other indications were that it is IBM's entrance into the shared-processor key-to-disk market.

Auerbach feels it is the marriage of key-entry systems with the controller. It is the controller that provides the disk storage, as opposed to the usual separate disk units per system.

Whether the system can be considered competition with the old established key-entry systems on the market is debatable. Considering it requires attachment to a virtual storage IBM System/370 computer certainly places this system in a class of its own.

However, the same idea of uniqueness applies to any mixed/multimedia system. About 1-1/2 years ago there were only three of these systems on the market. Today there are seven. Strangely enough, all of these systems are unique, and all were developed under a different guise.

For instance, Recognition Equipment, Inc. (REI) manufactures a system called Input 80. To this system, REI incorporated an optional feature called Total Data Entry which allows users of rather high-volume OCR page readers to gain the additional key-entry capability. In other words, the key entry function is pretty much an adjunct to the OCR feature.

Another of the original trio is Scan-Data Corp. with its 2250. This system was developed to handle both OCR-readable and non-OCR-readable data. The Scan-Data system consists of an OCR reader for scanning OCR-readable data, a CRT-type keystation for handling OCR rejects and a non-CRT keystation for entering non-OCR-readable data.

Software available allows key entry of certain data from a document, and then OCR scanning of certain data from the same document, with all data from the same document merged on the output tape. Reentry of OCR rejects can be done with little or no impact on the scanning throughput.

A different system is available from Cummins-Allison. With its background in mark-sensing equipment for turnaround documents (Scanak), the company designed the 4400 to handle turnaround documents. The system consists of a document and ticket scanner and a number of CRT-type keystations for entering data from documents that can not be accepted by the scanner; it also handles scanner rejects.

The only similarity between these systems is it all started out with OCR and then added key-to-storage to create the multimedia system.

However, early this year, Entrex, manufacturer of the 480 key-to-storage system, came out with enhancements to it. They took a different route and added OCR reading to their established key-entry system. The Entrex 480/720 system is designed to perform data entry off-line from the main computer systems.

The 480 consists of up to 32 keystations, a minicomputer, magnetic disk, magnetic tape, a complete data entry software package and various options including communications capabilities.

The Model 720 OCR reader can be added at any time with no interruption of work flow. With the addition of the scanning capability, data from machine-printed documents is automatically captured and processed concurrently with keyboard entry from any of the 32 keystations.

The latest entrant into the mixed-media area is Control Data Corp. This September CDC entered the key-to-disk field with what it called a distributed data entry system. Titled the Cyberdata, the system, which can handle up to 63 local or remote keystations, is designed to allow large users to replace five or six separate key-to-disk systems with two of the Cyberdata systems.

The company claimed that in March it will adapt the units to concurrently drive OCR equipment in the background area while data entry continues in the foreground. Thus, it will be multimedia.

At the time of this writing, Cyberdata systems can handle OCR separately, permitting a user to do key entry during the day and then use the system's processor to run an OCR device at night.

At the time Auerbach initiated the inclusion of mixed-media systems in its input/output reports, the following statement was made: "Our stress on the multimedia system will relate to the integration of an optical reader and a keyboard-to-disk system into a single data entry system so there is on-line interaction between both systems, with software to operate both systems simultaneously."

Basically, it was referring to OCR and key-to-disk. Although this is still our feeling, there are other forms of multimedia systems.

One system in particular is the General Computer Systems (GCS) System 2100 which is a shared-processor, multifunction, multimedia, source data entry system. It is designed for the large data processing user and can be considered as an input/output front-end section for a computer system.

As a multimedia system, it cannot be considered competition for Cummins-Allison, REI, Scan-Data or Entrex since these systems all consist of only key-to-storage with OCR/OMR configurations. It is also one of the very few offering up to 64 keystations in the system.

However, its basic difference stems from its various applications. For instance, Datatone, which the manufacturer claims is exclusive with the GCS 2100, features Touch-Tone data entry.

With the addition of the Datatone controller, all that is required is the Touch-Tone telephone.

Any or all data transmitted via Datatone entry may be keyed or entered through an optional card dialer.

After years of predicting the ultimate destiny of OCR in data entry and the transitory nature of key-to-storage, the data entry industry may have at last found the perfect combination.

From three multimedia systems to seven in 1-1/2 years may seem like slow progress. However, the introduction of the IBM and CDC systems may start the wheels of progress turning in other companies.

Snyders is project editor for Auerbach Computer Technology Reports.

Competition Growing

Data Entry, Communications Marts Becoming One

By Steve Thurston
Special to Computerworld

WALTHAM, Mass. – The line of distinction between data entry and data communications is becoming hazier with each new product announcement.

Traditional keypunch replacement products are incorporating data communications capability to take advantage of the growing market in remote data entry. Conversely, more and more data communications terminals are performing data entry functions.

As suppliers move to round out their product lines, two previously distinct markets are merging. Companies are now meeting head-on with others they never previously considered competitors. While greater competition is fostered, ample market opportunities also exist for all participants.

During 1974, an estimated 160,800 data entry/communications devices were shipped to the U.S. marketplace with a corresponding dollar value of $1.2 billion. By year-end 1974 the installed base of such equipment was 840,500 units at $5.3 billion. Growth rates of some 15% per year can be expected in the number of devices in use through 1979, bringing the total number in use to an estimated 1.6 million devices representing $12.7 billion.

Segmenting Market

There are several distinguishing characteristics which are meaningful in segmenting the general-purpose data entry/communications marketplace.

One of the most basic is whether the device uses a keyboard as its prime means of input.

Another is its programmability – can the device be programmed by the user?

And the third primary characteristic is whether it possesses communications capability. Building on that general framework, a prognostication for the various equipment categories can be formulated.

The future of the keypunch market is rather bleak. While use of the 80-column unbuffered versions is steadily declining, buffered versions are still experiencing some healthy shipment activity.

It is the 96-column market that holds the key, as it were, to the overall market. Its future is directly linked to the System/3 which nears the end of its product cycle.

In addition, the 3740 data entry system is making a grave impact on this base, replacing 96-column devices.

Combining the effect of these two factors leads International Data Corp. (IDC) to predict a peak in the installed base of 96-column keypunches by year end.

Key-to-tape devices continue their steady decline in usage.

As for the IBM 3740 data entry system, the IBM 3741-1 and 3742 (dual-station versions) represent the bulk of stations installed today, but the mix is rapidly changing, reflecting user desires for the other models possessing programmability and communications capability.

The IBM 3741-2, with communications,

(Continued on Page S/4)

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Large Service Bureau Finds

OCR Puts Accuracy, Reliability, Costs in Users' Hands

By Delmar W. Smith
Special to Computerworld

ST. LOUIS – McDonnell Douglas Automation Co. (McAuto), which provides DP services for businesses throughout the U.S. as well as for all divisional companies of McDonnell Douglas Corp., is keenly aware of the staggering costs of data entry.

For example, keypunching alone accounts for a full 25% of our total cost of processing a 70,000-name corporate payroll.

To lower our costs while maintaining the flexibility to support the wide range of DP applications encountered every day, we use all the well-known types of data entry equipment, including on-line, key-to-disk, buffered keypunch, the IBM 029 keypunch and optical character recognition (OCR).

Of these techniques, OCR is of special interest to McAuto because it allows data entry responsibility to be placed in the hands of the user, who usually is better able to control the accuracy, reliability and costs than a large central data entry shop.

We recently replaced three Control Data Corp. 915 page readers with Scan-Data Corp. page/document readers at our Long Beach [Calif.] and St. Louis data centers, mainly because we were running out of available reader time, but also because we foresaw a requirement for reading the several different typefaces provided by the new equipment.

The reader in St. Louis is utilized over 250 hour/mo, more than double the utilization rate of the Long Beach reader. The reason for the big difference in utilization is that in St. Louis we are reading, in addition to departmental OCR typing, the daily output of 140 typists in a facility completely devoted to OCR typing.

Compared Costs

Having this special OCR typing facility in a city near one of our keypunch facilities of similar size and capacity allowed us to directly compare the cost of keypunching with OCR typing and scanning.

The results revealed OCR costs 7-1/2% less per hour for labor and equipment than keypunching. In addition, a very real cost savings was found in OCR typing because of increased productivity through a reduction in keystrokes.

Generally, we experience from 1,000 to 2,000 stroke/hour greater throughput by typing. But the really big cost savings are found in eliminating keystrokes.

For instance, just a few weeks ago we reevaluated an existing keypunch job we thought was very competitive. It was designed for partial freeform. By using the computer to generate several characters, we saved several keystrokes per card.

But after examining the possibility of using typing instead of keypunching, we found we could save another 10 strokes per card image. Since this was a six-million-card conversion, the savings totaled nearly 12,000 hours of work.

I saw another example of this kind of savings recently when we were asked to bid on a two-million-record conversion. The competition, which was an in-house operation using on-line equipment with part-time labor, was formidable, to say the least.

Our first "cut" at this job was a disaster. We were way over the client's in-house costs because we were trying to emulate his approach to the job. But after performing another analysis of the application, using OCR typing as the input, we found the scanner could generate 375,000 records automatically with very little effort on our part.

It is true the client could have done the same thing with his computer, but it would have meant an extensive and costly reprogramming effort which he was not willing to expend.

Stroke Savings

Some of the more obvious stroke savings through OCR are realized by eliminating zero-filling of amount fields. If you have an eight-position field requirement with an average usage of four significant digits, you can save four strokes per field by eliminating the zeros and allowing the OCR scanner software to right-justify and zero-fill the field.

The negative factor in OCR typing is that a keystroke is required for each field separator used. But this disadvantage is far outweighed by positive factors such as the error-correction techniques used by the typist.

Erroneously typed characters, fields and whole lines are deleted by using special characters on the typing font as defined to the scanner software.

A typist or a keypunch operator usually knows by "feel" when he makes a finger error. An OCR typist can look at the character and take positive action immediately, but a keypunch operator must wait and try to interpret what was punched.

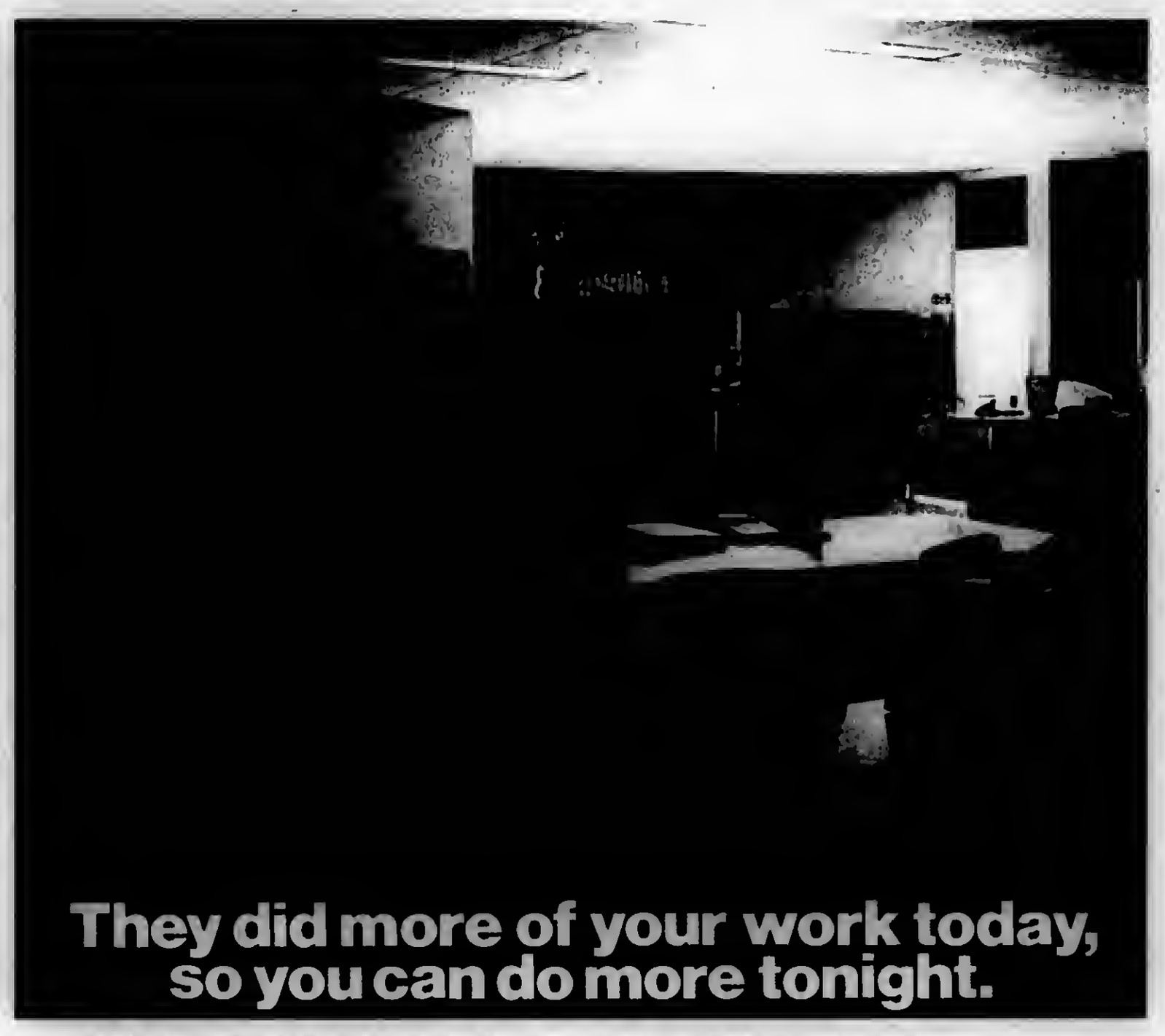
The keypunch operator must skip out the error card and duplicate over to the error, then make a correction. An OCR typist, however, can make corrections immediately with no problems.

Our studies showed it takes nearly five clerks preparing keypunch worksheets to keep one keypunch/key verifier busy. These clerks are doing nothing more than copying source information into a card format.

It is just as easy for them to type the data in the first place and eliminate the requirement at central keypunch. We have done this in our St. Louis and Long Beach facilities by placing more than 100 OCR typewriters in operating departments.

Only minimal training is required to teach clerks how to type a given application. Usually one to two hours will be enough to get a typist started. We have found most users of DP would much rather be responsible for the integrity of their own data files than have central keypunch involved.

Smith is section manager of data entry services at McAuto.



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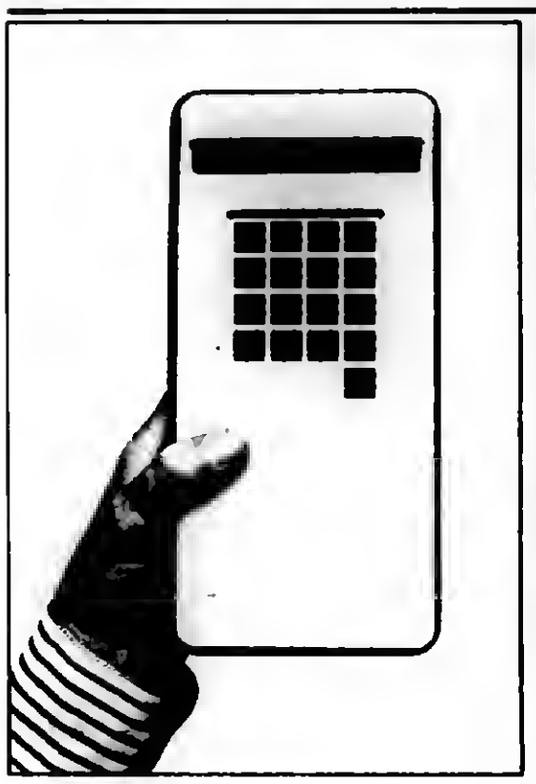
System 2300 comes from the Data Entry specialists, and is backed by one of the finest support teams in the industry. With System 2300 you can consolidate your data management resources, increase operating efficiency, reduce central computer usage, and make a significant contribution to your bottom line. By stretching your 8-hour day into 24 hours of productivity.



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*Documentation available on request

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With Push-Button Phones

Simply 'Let Your Fingers Do the Keying'

By Rick Moss
Special to Computerworld

Push-button telephones were used commercially for the first time in Carnegie-Grecnsburg, Pa., on Nov. 18, 1963.

Eleven years later, 20,221,000 of them had been installed, and new orders were averaging 2,500,000 a year.

But people aren't just talking on push-button telephones these days:

- A retail clerk takes a customer's credit card and, using a push-button telephone, keys the cash register code, the credit card number and total purchase amount. The computer on the other end checks a disk file for credit card status (stolen or otherwise invalid?) and credit limits.
- A catalog customer calls in his order on a push-button telephone. The computer's voice response unit indicates the item is in stock and the customer relays details of his order by keying numbers on his telephonc. Hc can even request the order be left in his garage.
- A salesman for a wholesale distributor picks up the receiver of a push-button telephone in his client's office. After dialing his warehouse, he keys an authority code, customer number and code and quantities for the items ordered. Processing of the order begins immediately with a minimum of paperwork.

All these applications are done with ordinary push-button telephones that function the same way. Push-button telephones generate two tones whenever a button is pushed. The total of eight separate tones available for character generation are divided into two groups, A1 to A4 and B1 to B4.

Each number, 0 to 9, and the characters "*" and "#" are represented by two tones, one tone from each group. Both tones must exist for approximately 40 msec and be within ± 1% of the specified frequencies to generate a character.

Transmission rates of up to 20 char./sec are possible. Keying rates of three char./sec are common.

Repeat Characters

A few problems occurred when push-button telephones were first used as data entry devices. One problem was repeat characters. If a button was held down too long, the character was generated more than once. Modern demodulation devices have eliminated this problem.

Telephones have always been protected against errors caused by depressing more than one key at a time. Check this yourself. Listen to the sound of a number on a push-button telephone; while keeping that number depressed, depress a number beside it. The B tone is eliminated.

Let up on the second number and depress a number above or below the original button. The A tone is eliminated. Simultaneously depress any two keys on a diagonal and no tones are generated.

Standard push-button telephones use only 12 of the possible 16 combinations of A and B tones. Acoustically coupled telephone terminals use all 16 combinations. Alphanumeric terminals either transmit two numbers for each character or add a third group of tones, C tones, and transmit three tones simultaneously for each character.

Development of Push-Button Technology

Push-button technology was, of course, developed some years before it was applied to telephones. A card reader was for sale in 1960 that transmitted information from 80- or 51-column card with signals similar to A and B tones. Communication was achieved by a modem equipped with a standard dial telephone and handset.

The first telephone data entry systems connected push-button telephones or card reader terminals to card punches or teletypewriters. The user dialed a telephone number and waited for an answer.

After the answer tone was heard, he keyed and holes were punched in a card or paper tape. If the user realized he had made a mistake, extra steps were taken to make a correction.

With punched cards, he signaled the card punch operator to remove the erroneous card and then rekeyed the record. On paper tape systems, the user keyed a spccial code, then started over.

These electromechanical devices were subject to frequent maintenance and failure, but had a low initial price.

Meanwhile, expensive dedicated computer systems were also available for push-button data entry. They offered voice prompting for the user, file inquiry responses and other man-machine interface software. The disadvantages were price and customer-provided software.

Enhancements Added

In the last five years, though, at least a dozen companies have entered the telephone data entry market, building and selling equipment specifically designed to enhance and facilitate the basic push-button telephone.

On the user's end, there are acoustically coupled terminals that provide 256-character memories, light-emitting diode (LED) displays, alphanumeric keyboards, hard-copy output and other options. Central receiving systems are no longer electromechanical; they use the cheaper and better computers now available with turn-key software.

Telephone data entry itself is not unique, but a special application of the total concept of data entry. Two applications are particularly suited to telephone terminals: file inquiry and data collection.

File inquiry involves two-way communications between the user and the system. Voice responses are commonly associated with the application such as the bank computer that tells customers their current balances in response to account numbers. The clerk who checks out a customer's credit card is also using file inquiry.

Data collection allows companies a broader scope of operations. Data can be gathered easily and quickly from remote sites, using non-DP people. In fact, the telephone terminal's main competition is the U.S. Postal Service. A company has to choose between having its salespeople write or type all orders and:

- Mail them to Order Processing.
- Forward the paper to Data Entry.
- Forward the data to Data Processing.

Or its sales force could dial the computer and enter orders directly.

Push-button data entry has been available for more than 15 years. The technology is well advanced and the hardware is among the most reliable in DP equipment. And there are more than a dozen companies selling in the marketplace. Yet, in terms of product life, telephone terminals must be considered toddlers.

Even Ma Bell has acknowledged the potential use of her telephone instruments and lines for data entry. Push-button phones now come equipped with circuits that disable the tone generators as soon as the telephone number is dialed.

It is foreseeable that charges may soon depend on voice or data transmission usage.

The question is: Will industry make use of all that is available to it?

Moss is a product manager at General Computer Systems, Inc.

Line Between Communications, Data Entry Marts Grows Hazy

(Continued from Page S/2)

is growing rapidly in usage, primarily with System/3s.

And the 3741-3, programmable but without communications capability, is not expected to be a major factor in the growing use of the 3740 data entry system.

The Model 4, essentially an intelligent terminal, will experience healthy growth.

Conversational terminals, in general, are a declining market.

The great majority of them are printer-based like the ubiquitous Teletype and the IBM 2740/41. Their population will gradually decline.

CRT versions are not as plentiful, yet may be expected to grow at a moderate 10% rate per year.

Editing terminals are expected to exhibit strong growth. The printer-based terminals which incorporate a buffer have existed only to a limited extent, but should be bolstered by IBM's 3767 and 3770 family of terminals.

The CRT versions (with line/character insert/delete capability) are comprised primarily of IBM 2260/3270s and compatible replacement versions. The Teleype Model 40 is included as an intelligent product marketed as a direct 3270 replacement which are included here as processing terminals.

Key-to-Disk Declining

Key-to-disk systems are a declining market measured by annual shipments. The installed base is expected to peak by year-end 1977 and some replacement activity is becoming noticeable.

This forecast does not spell doom for current manufacturers, however, as most of them are moving into the communications parts of the product segments, included here.

Stand-alone processing terminals (intelligent terminals), meanwhile, are expected to exhibit very healthy growth rates. The installed base at year-end 1979 is forecast to be over four times that of December '74.

Clustered processing systems, such as the IBM 3790, Four-Phase systems, Data 100 Keybatch, Computer Machinery Corp. 5780, while existing on a limited scale today, are expected to exhibit the greatest growth rates in the coming years as the trend to using intelligence to capture data at its source continues in the data entry/communications marketplace.

IBM's Blessing

In such a dynamic marketplace, IBM has played a comparatively minor role to date. Outside of its keypunch base, it has been independent suppliers who have been first to develop newer, more sophisticated devices.

A much stronger stance has been taken, however, in the last year or so.

New products, software and line protocol announcements suggest rather certainly that data entry/communications is very much in IBM's plans for users for the balance of the '70s.

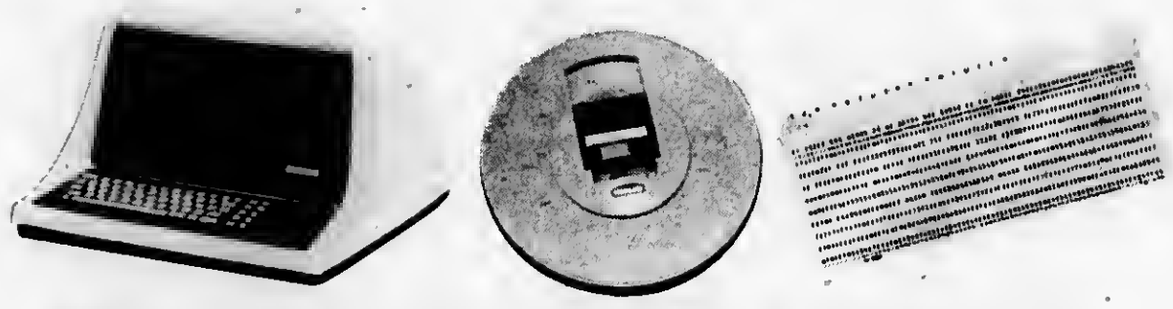
With the final blessing of the Giant, distributed processing should provide for the bulk of the expected market growth in the next five years.

Thurston is account manager of corporate planning service for International Data Corp., a market research firm.

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Survey Finds Key Entry Performance Depends on Usage

By Fonnie H. Reagan
Special to Computerworld

Productivity or performance is a necessity: convenience is a luxury. That's the story when purchasing almost anything, including key entry devices.

For the last six years, vendors of key-to-disk equipment have used productivity as the keynote of their sales pitches.

While the prospective customer was still reeling from impressive statistics on keystrokes per hour, the salesman would trot out other advantages such as data validation at the source, longer record lengths, output directly on tape, output tape blocking and file manipulation – all intended to convey the impression of greatly improved productivity.

Over the course of the same six years, Datapro Research Corp. has had the opportunity to evaluate dozens of key-to-disk data entry systems and talk with many hundreds of users of keypunches, key-to-disk systems and other data entry equipment.

Our subjective impressions were that the key-to-disk systems do provide a great number of useful features and should live up to the claims for increased productivity. But we also found, it seemed, that many of the features such as longer record lengths and table lookup, for example, have only started to be used extensively within the last year or so.

It is not difficult to rationalize reasons for the slow acceptance of the powerful data validation and record-length features of these systems.

Existing user programs running on the mainframe were already geared to specific input procedures. And the procedures for gathering and recording data for input preparation were well established.

Users do not respond well to the company pressures evident when the DP department shuts down for a while to convert to new procedures. It has to be done on the fly.

Productivity and Features

Subjective conclusions and rationalized reasons are great for discussion, but do not carry the credibility hard facts do. In June 1975, Datapro surveyed its subcribers to assess current user satisfaction with particular key-entry equipment and establish usage patterns. The responses to that survey provide a means to address the questions of productivity and feature usage.

In total, the survey attracted responses from 400 users with a total of 823 products representing 6,684 keying stations. Represented in the survey were keypunches, key-to-disk systems, key-to-diskette units, key-to-tape units and key-to-cassette units. This base of information includes users' experience with unbuffered keypunches (IBM 29), buffered keypunches (IBM 129), key-to-disk systems (all models) and key-to-diskette units (IBM 3740).

Regarding productivity, we asked the users to state the data volume both in terms of records keyed per day per keying station and keying rate in keystrokes per hour. Further light was shed on the question of productivity through questions on average record length and the percent of each record that was manually keyed.

Questions were asked about specific data validation and editing features to gain insight about the degree of utilization of these features.

In response to the question on records per day per keying station, the users responded as follows:

	Under 750	751 to 1,500	Over 1,500	No. of responses
Unbuffered keypunch	62%	23%	15%	123
Buffered keypunch	30	37	33	128
Key-to-disk	23	44	33	148
Key-to-diskette	32	29	39	47

To the question about keying rate in keystrokes per hour, the users responded as follows:

	Under 5,000	5,001 to 10,000	10,001 to 15,000	Over 15,000	No. of responses
Unbuffered keypunch	21%	49%	28%	2%	92
Buffered keypunch	10	48	36	6	109
Key-to-disk	3	47	41	9	151
Key-to-diskette	12	30	46	12	41

There is no direct correlation between these two groups of figures. Remember that in the first chart, the record volume is based on a day's output. The second is based on the productivity while working. If a device is used only one hour a day, it may be blazingly fast without producing many records.

A more thorough understanding of the figures presented in these two charts can be gained by taking a look at the next two.

In response to our question about average record size in characters, the following distribution was obtained:

	Under 60	61 to 80	81 to 150	Over 150	No. of responses
Unbuffered keypunch	56%	44%	0%	0%	154
Buffered keypunch	46	54	0	0	160
Key-to-disk	20	45	31	4	165
Key-to-diskette	24	43	33	0	63

The apparent disparity between the figures for record volume, which indicated similar output from buffered keypunches and key-to-disk systems, and keying rates, which showed a slight edge for the key-to-disk units, can thus be resolved to some extent: record lengths tend to be longer when using key-to-disk systems.

But what about relating the number of keystrokes per record to the length of the record? Both keypunches and key-to-disk systems include provision for automatic duplication, which can make the number of keystrokes per record lower than the number of characters in the record. In response to just that question, our subscribers indicated the following ratios of number of keystrokes to total record length:

	0 to 0.25	0.26 to 0.50	0.51 to 0.75	0.75 to 1.00	No. of responses
Unbuffered keypunch	10%	18%	45%	27%	124
Buffered keypunch	4	26	44	26	141
Key-to-disk	2	27	43	28	153
Key-to-diskette	2	24	48	26	58

The numbers are surprisingly similar for the four types of devices represented. But the surprise diminishes if one takes into account that the newer types of devices are probably using procedures set up for the older devices they replaced. Given similar procedures, the numbers would have to be similar.

Taken as a whole, the charts tend to support the view that key-to-disk systems are faster or more productive than keypunches. However, the buffered keypunches acquit themselves quite well.

In response to questions about usage of specific data validation features, 149 key-to-disk users indicated the following frequencies of usage: batch totals were used by 71%, zero batch balancing by 63%, check digits by 52%, value checking by 40%, range checking by 46%, table lookup by 38% and reformatting by 71%.

In the early days of key-to-disk systems, the users may well have just been looking for increased productivity, but it is quite clear many of these users have now found the data validation features to be useful tools.

Larger installations will surely go the way of key-to-disk for centralized data preparation. However, a substantial portion of the load will be shifted to outlying locations through distributed processing and data communications.

At the remote points, there will be both key-to-disk systems batching data for transmission to the central facility and intelligent terminals that will enter data to the central facility in more of an inquiry/response fashion.

The introduction by IBM of the 3760 key-to-disk configuration of the 3790 communication system will have an impact. Prior to the 3760, key-to-disk meant transcription to magnetic tape for transfer to the host computer. With the 3760, the transfer of batch data is made over a computer I/O channel.

It is an interesting blend of IBM's years-long penchant for on-line data entry and recognition that the host processors couldn't really handle high-volume data entry from multiple sources very efficiently.

Viable Alternatives

Provision by the independent key-to-disk vendors of an option for channel connection instead of or in addition to output to tape could provide users with two viable alternatives. The disadvantage of the on-line connection in place of magnetic tape is that it reduces the flexibility for the key-to-disk system to do file manipulation, which is well within the capability of many systems.

For smaller installations, the rapid emergence of the multiuser minicomputer configuration allows data entry and data processing to be combined interactively in transaction processing. Many installations will find this an attractive solution to their DP needs.

Continued growth of sophisticated applications loosely grouped under the label of data base management points to increased data gathering to support the increased data manipulation.

Meanwhile, the lively spirit of competition among mainframe vendors, intelligent terminal vendors, key-entry vendors and minicomputer vendors ensures the continuation of the rapid evolution of new devices and techniques for data entry.

Users will need to carefully match their needs to the many viable alternatives to reap the promised benefits.

Reagan is a research director for Datapro Research Corp.



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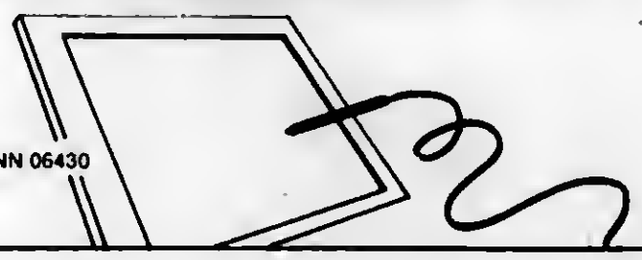
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For Manufacturer

Distributed Processing Eliminates Data Entry Bottleneck

Special to Computerworld

NORTHRIDGE, Calif. – How does a company eliminate the data entry bottleneck?

Teledyne Systems Co., a maker of special-purpose computers, navigation systems and hybrid circuits, has apparently done it by switching to a distributed DP network featuring key-to-disk source data entry, according to Ester E. Boydstun, manager of DP systems.

"Since May, when the system was installed, we have dramatically reduced our turnaround time, and we've been able to eliminate an entire third shift, which more than offsets the cost of the equipment," Boydstun said.

The company is holding its entry errors now at less than 1%, even though much of the data verification work has been eliminated. DP is now being done with fewer personnel than were needed two years ago when the DP workload was 18% lighter, Boydstun said.

Data 100 Corp.'s Keybatch system permits data to be entered directly from raw source documents at several sites in considerably less time than it formerly took keypunch operators to enter the same data.

The system features a Model 78 and a Model 74 programmed terminal supporting seven local keystations, two of which are located in separate user departments several hundred feet away from the central processing site here. These provide input through regular coaxial lines.

A pair of remote keystations is located at a plant in Culver City, some 20 miles away. These interact with the terminal processor here through standard dial-up voice-grade lines.

All keystation input is entered onto a 5M-byte disk. The dual processors permit data entry to occur concurrently with batch processing. The Model 78 employs a dedicated 9,600 bit/sec line and communicates with an IBM 370 located at Teledyne-Ryan in San Diego.

Hand Delivery of Cards

The network replaces an IBM keypunch system using Model 129 and 029 keyboards. Source documents at that time had to be physically delivered to the punches, and the punched cards were carried to the DP center for batch transmission to San Diego.

Reports were often delayed, and the processing workload typically piled up for handling during the more expensive and now-eliminated third shift.

That was too cumbersome a method for a company with Teledyne's Systems' considerable DP requirements.

The 600 line/min Data 100 printer here hammers out an average of 6.4 million line/mo.

Since January 1974, when the company was actually hauling data around from service bureau to service bureau for punching as well as processing, Teledyne Systems has developed a full-fledged in-house capability.

Boydstun's strategy in training keypunch people to operate key-to-disk equipment was to set up the programs at first to look as much like the IBM 129 keypunch formats as possible.

Only later, after the operators had become accustomed to the video display approach, were the programs changed to take advantage of table lookups, zero batch balancing, cross-footing and other editing features of the equipment.

There was a learning curve of about two weeks during which operator efficiency dropped and then rose to surpass previous levels, according to Boydstun. General keystroke efficiency seems to have improved by about 11% and is continuing upward, he said.

Boydstun is now convinced distributed DP is the wave of the future. "I feel very strongly that centralized data entry is a concept that has gotten too expensive to survive," he said.

Net Collects Data On Firm's Inventory

Special to Computerworld

CHICAGO – Collecting variable production and inventory control data and feeding it into a highly sophisticated and automated production system can be a challenging job of systems design at any time.

But when the data collection involves some 30 remote job sites in the world's largest cold roll steel mill, the problems would seem to be great indeed.

At the Indiana Harbor Works of Inland Steel Co., however, a basically simple and functional answer has been designed that keeps the information flowing at all times on all variables involved in the production and inventory control of the approximately 150,000 tons of steel that are in process at any one time.

The basic information system for collecting and feeding back data throughout the 200-acre mill is an IBM 1030 network, with terminals set up at 30 job sites.

In addition to the nonvariable information, however, the production process entails the reporting of variable data such as changes in the mix process or in line speeds.

This variable information is entered at each of the 30 job sites on a Wright Line Co. Model 2600 punch.

As information on changes in the mix process or line speeds is read, it is encoded by the job site attendant on an 80-column card by means of the 2600 punch.

The attendant inserts the card, which has been precoded by the DP center, and punches the information in the appropriate column. The card is held in place by an adjustable card locator and can be moved to any column by engaging the carriage release.

Multiple punching in one column is accomplished by either holding down the space key to suspend all spacing and depressing the required keys or by depressing any number of keys simultaneously.

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Not Only Productivity Improved

Unquantifiable Factors Gild the Key-to-Disk Lily

By Teri Morehart
And Adele Gronbach
Special to Computerworld

SANTA MONICA, Calif. – There is perhaps no more richly researched area in all of DP than the cost savings achieved by replacing keypunch operations with key-to-disk.

Innumerable studies have been made by companies throughout the country, measuring output, reducing it to such categories as keystrokes per hour and then deriving the increase in productivity.

Since these studies showed productivity increases from 25% to 50%, they served as a great stimulus to the key-to-disk industry and were widely reported. Still, most of them had odd footnotes, such as: "Does not include savings realized by DP or user departments from lower error rate" and "No factor included for costs of employee turnover."

This was certainly predictable, engineers being engineers. After all, since abandoning keypunch operations in favor of key-to-disk was clearly shown to be cost-effective based on readily quantifiable data, why gild the lily by adding in factors that were much more difficult to measure?

Since management was clearly going to make the switch based on these productivity increases, what was the point in refining the data to show that the 50% increase was really 62%.

This fact, more than any other, has hidden the revolution that has transformed yesterday's keypunch room into today's "keyprocessing" department.

The keypunch room of 10 years ago resembled a Hong Kong sweat shop. Scores of keypunch machines were clustered in a large room off in a corner somewhere, the noise was incredible and confusion ran rampant.

Chips from punched cards and torn-up cards littered the floor, and the biggest disaster was a dropped stack of cards which would scatter among this debris.

It took a very skilled and experienced supervisor just to keep the work flow moving. Since verifying was done on a different machine then keying, there was an ever-present danger that verifying work might stack up, and keypunch operators would sit idle, waiting for the verifiers to catch up.

Conversely, if major errors were detected, either by the verifiers or the DP center, an unanticipated workload would be added.

Experienced supervisors would estimate a typical operator would produce about 8,000 keystroke/hour, with about a 1% error rate. Trainees, however, had a much lower keying speed and their error rates often were as high as 5%.

True, an operator's output was measured, but it was done by a ruler. Whatever the complexity of the job, the operator's performance was assessed by the height of his completed cards. Only the supervisor's qualitative judgment would moderate that "inches-per-shift" criterion.

For supervisor and operator alike, then, the entire environment was frantic and dehumanizing.

It was clear (or should have been) that it was time someone gave this problem the attention he had been reserving for selecting a faster mainframe.

Unfortunately, companies first bought key-to-disk systems for entirely different reasons.

Appalled by the soaring costs of keypunching, these companies became actively interested in finding a way to increase the efficiency of this operation. The first interest in key-to-disk systems was totally based on this consideration.

All of those productivity studies concentrated on such factors as:

- Faster keying possible with an electronic keyboard.
- Automation of much of the verification process.
- Elimination of card costs.
- Reduction of downtime to less than 1%.
- Reduction of demand on the mainframe.

Those were significant factors, of course, and they resulted in savings that stimulated company after company to convert from keypunch to key-to-disk equipment.

Still, while this new equipment certainly introduced major efficiencies, it did not, in and of itself, directly address the root problem of operator dehumanization.

Soon, however, operators began to understand the power and flexibility of the new system and began to see themselves in a much more professional light than in the days of keypunch machines.

Many devised ways to make better use of the system – ways that hadn't occurred to the manufacturer, who got valuable feedback that helped optimize both hardware and software.

In other words, the operators became motivated to improve their performance; the employee turnover problem was sharply reduced.

To reinforce this new pride and motivation, companies provided an office atmosphere, transforming the old keypunch room into a modern keyprocessing department.

With a Computer Machinery Corp. 1800 system, for example, as many as 64 keystations, and with multiple systems even more, may be in that one room, but there is none of the old confusion and clutter.

The supervisor sits at his desk-styled console containing a control panel and command console. Nearby is other equipment – magnetic disk units, magnetic tape units and a line printer.

The operators key at top speed with their electronic keyboards.

Verification is performed at the same keystation, and it is a much simplified process. Check digits supplied by software sharply reduce verification requirements for jobs such as payroll, invoicing and inventory.

For order entry or accounts payable jobs, the auto batch balance feature automatically validates the numeric fields the operator keys against reference totals entered at the beginning of a batch. All in all, verification is a much easier task.

If a surprise crash job comes in, an operator simply closes out a batch temporarily, processes the crash job and then resumes work on the original batch.

If the surprise job is really a crash, one operator can pass the source documents to a second operator, and, by use of the write/verify overlap feature, they can write and verify batches almost simultaneously.

Other available functions and reports aren't just fancy features engineers dreamed up; they are real tools supervisors have asked for and use every day, including:

- Up-to-the-minute knowledge of the status of everything in the system through status reports: disk status, format status, job status, keystation status, operator status, event log, maintenance log and maintenance report.
- Total backup capabilities through supervisory procedures such as batch save reload, library save/reload and system save reload.
- The capability to tailor the system to individual needs of each user through a performance optimizer, a system priority feature, a system resource allocator and a tape code compiler.
- The capability for extensive "cleaning up" and reformatting of data through formattable edits, programmable edits using Cobol and RPG-II in the background.

The supervisor can also obtain reports that enable him to analyze productivity by operator or may also get statistics that tell him the productivity of the entire keyprocessing department. For example, a job analysis report provides total statistics for each job, and allows the supervisor to assess the relative difficulty of jobs.

This not only permits a realistic assessment of operator performance, but also indicates any jobs that should be redesigned to permit higher productivity.

The job analysis report shows, for each job:

- Total records and total hours required to write and verify the job.
- Keystrokes per hour and records processed per hour.
- Job standards for writing and verifying records.
- Various cost data.

Morehart is manager, special projects and Gronbach is product manager, CMC 1800, for Computer Machinery Corp.

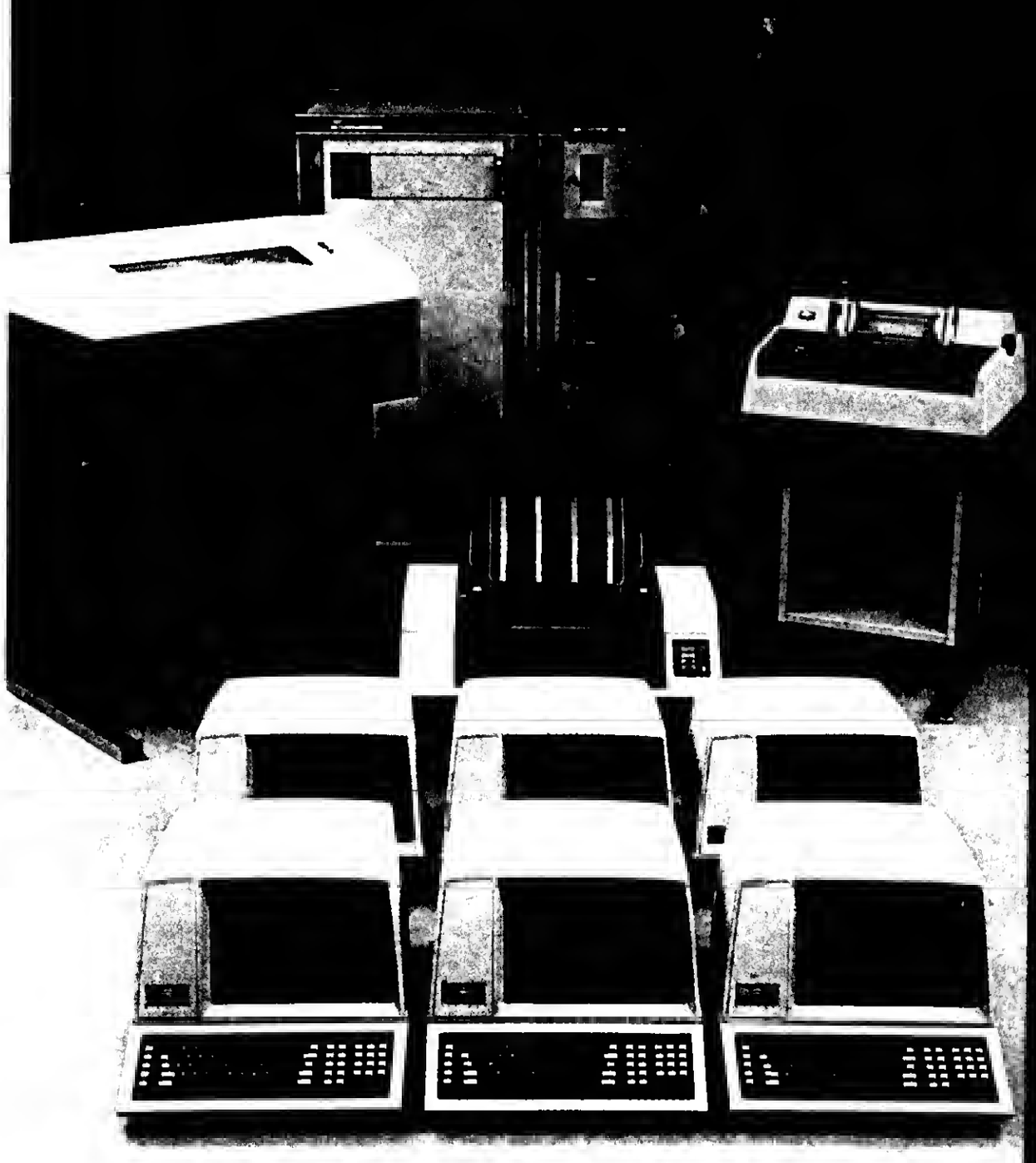
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INTELLIGENT TERMINALS, MINICOMPUTERS AND TELECOMMUNICATIONS SYSTEMS

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Complex System Unneccessary

User Data Input Proves Economical in Small Network

By Charles W. McKellar
Special to Computerworld

NORTH KINGSTON, R.I. – A common belief held by small- to medium-size DP shops is the use of key-to-disk, key-to-tape, etc. is only justifiable in large installations.

This belief is particularly valid in those small shops (five to 10 machines) in which a portion of the data entered is through turnaround documents such as job packets, etc.

Although some data entry systems are economically justified when as few as five machines are replaced, there remains a significant number of users who, while having made significant progress in the area of computer applications, have failed to make use of available hardware to improve the flow of incoming data – particularly that data required to update major files.

Shortly after we installed our first CRT terminals, a problem which had always been present became more pronounced. Once the users had the capability to view firsthand the contents of a given inventory, structure or routing record, the timeliness of the data in the file became more crucial.

Maintenance to the various files had to be submitted in sufficient time to permit keypunching and verification prior to the scheduled maintenance run that night or be delayed until the following day.

This required the establishment of an unrealistic cutoff time for all maintenance data.

In reviewing our procedures and exploring alternatives, we felt that not only were we in DP not providing the level of support required by the users, but were, to some degree, adding to the cost of data entry by requiring input data be transcribed to special forms which were designed to aid the keypunch operator.

CRTs Correct Problem

The CRTs installed to support the data base inquiry system, by the very nature of the application, were subject to random usage with frequent periods of idle time. But the CRTs also appeared to be the logical vehicle to correct the condition.

Basically, we provided a relatively simple system which permitted an operator to place the CRT in a data entry mode and display a menu from which to select the format of the data to be entered.

The selected format was then displayed. All fixed data was displayed, along with indicators of the blanks which were to be filled.

The completed screen, when transmitted, was written as an 80-character record on disk. Procedures included an easy restart procedure, security codes and audit trails.

Minimal Bells and Whistles

The system was developed as a straightforward accumulation of incoming maintenance data. The use of whistles and bells were minimal and the system performed only limited editing. The computer system at that time was an IBM 360/40 with significant core restrictions that precluded much of the editing found in most key-to-disk systems.

This core restriction, coupled with our desire not to disturb existing systems, led us to the decision not to modify existing programs.

Instead, the data entry program which produced the daily audit list also punched the accumulated transactions which were then processed normally.

The system, while not sophisticated, filled a very real need on the part of users while reducing overall data entry costs.

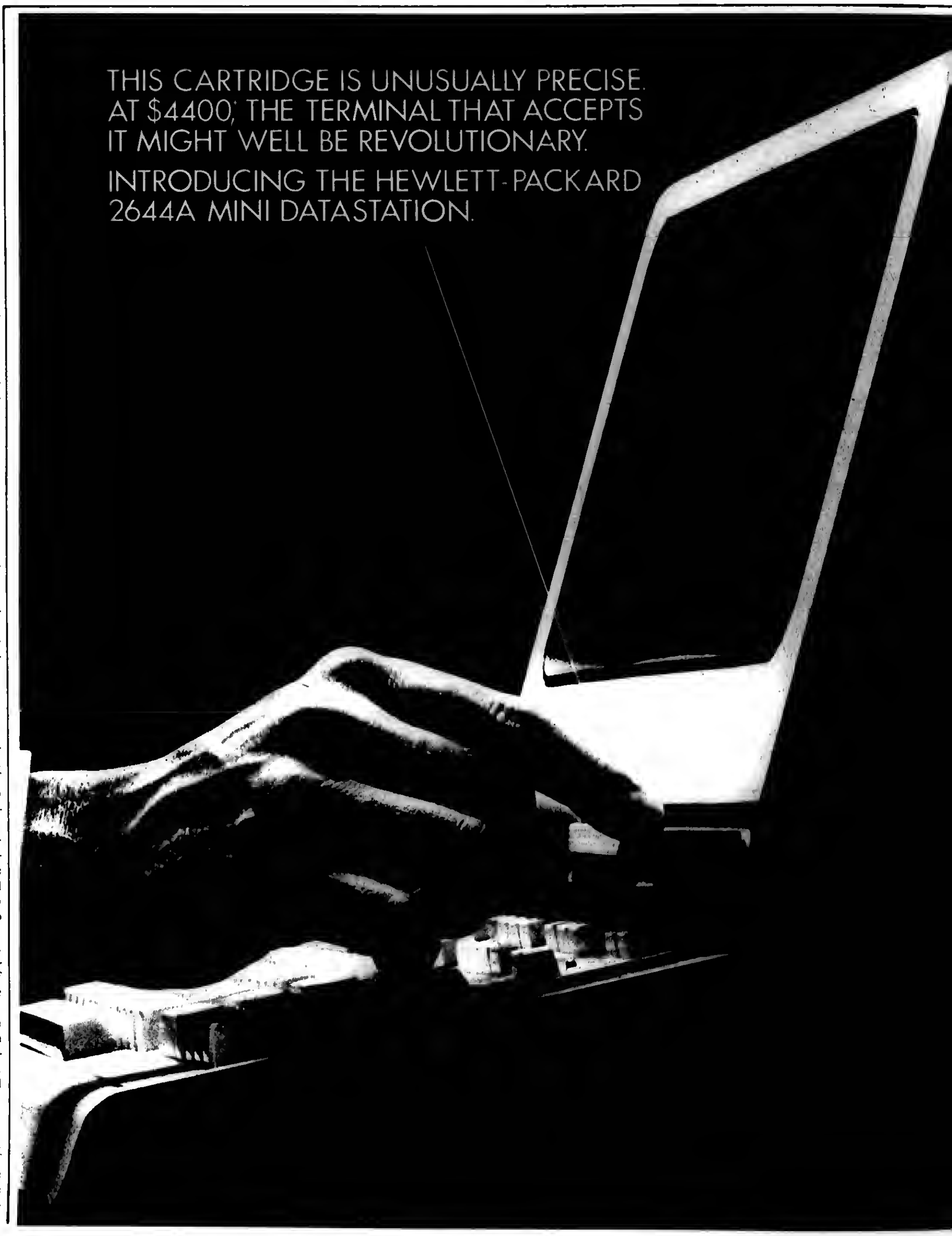
The CRTs which were installed for the purposes of file inquiry, were readily available to the user to enter data. No longer was data transcribed, keypunched and verified prior to processing.

The acceptance of the system is evidenced by the number of transactions which are now entered directly by the user. The premise that no one knows his data better than its owner has proven valid.

Costs have been reduced while providing better service which, after all, is the name of the game.

During the next few months, we will be converting from Bunker Ramo 2206 local terminals to Sanders 8170 series terminals. At that time, we will expand our system to include Turnkey Associates' Keymaster, a key-to-disk system which operates under control of Turnkey's Taskmaster and is designed to use installed CRTs as entry devices.

McKellar is manager of data processing for Brown & Sharpe Manufacturing Co.



Card-Based Inventory System Keeps Retailer Informed

Special to Computerworld

ABINGTON, Pa. – The morning after a recent robbery at a photo equipment and supplies company's retail store, the president was able to hand police a complete list of missing equipment.

A card-based inventory control system utilizing the turnaround card concept and based on the use of a Model 9610 interpreting data recorder manufactured by Decision Data Computer Corp. made this information, by manufacturer, product description and serial number, available immediately to David Harrar, president of Larmon Photo, Inc.

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As it finally evolved, the system tracks flow of items selling for $20 or more from day of receipt through sale and, in most cases, customer follow-up.

Color-Coded Cards

The key to the system is a color-coded set of three 96-column cards which follow an item through its stay at the company. The cards are:

- White – used as a warehouse record.
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Since 96-column cards serve Larmon as input for various accounting purposes as well as for the inventory control system, they must be coded as to function. All cards for the inventory control system carry a 5 code followed by a 1, 2 or 3 card color code, which is automatically punched and printed by means of the keypunch's reproduce feature. On the "52" (yellow or transfer card) the reproduce feature is used in conjunction with the punch suppress feature to print "transferred to store #___ and "date transferred___" without punching that information into the card. This leaves an area of the card available for punching in the future.

Two of the three cards are interfiled on the data recorder, with the third added at the computer to complete the set. Harrar pointed out that the interfile capability of the equipment enables elimination of a second computer run for this purpose, providing a cost saving at the outset.

Collated three-card sets are kept at the warehouse awaiting arrival of goods.

Cards 'Married' to Products

When a shipment is received – cameras, for example – the card sets are "married" to specific products.

First, a master card matching the type of camera received is drawn from a master card deck that Harrar maintains for all products he sells and also uses for generation of card sets and for production of price lists and reports.

This master card contains the camera's assigned product number, description, list price, actual cost, sale price and gross profit.

This card is then read into the data recorder memory so selected information can be automatically duplicated (punched and printed or, through the punch suppress feature, printed only) while "particularized" information, such as individual serial numbers and date received, is manually keyed in by the operator to produce a color-coded card set for each camera.

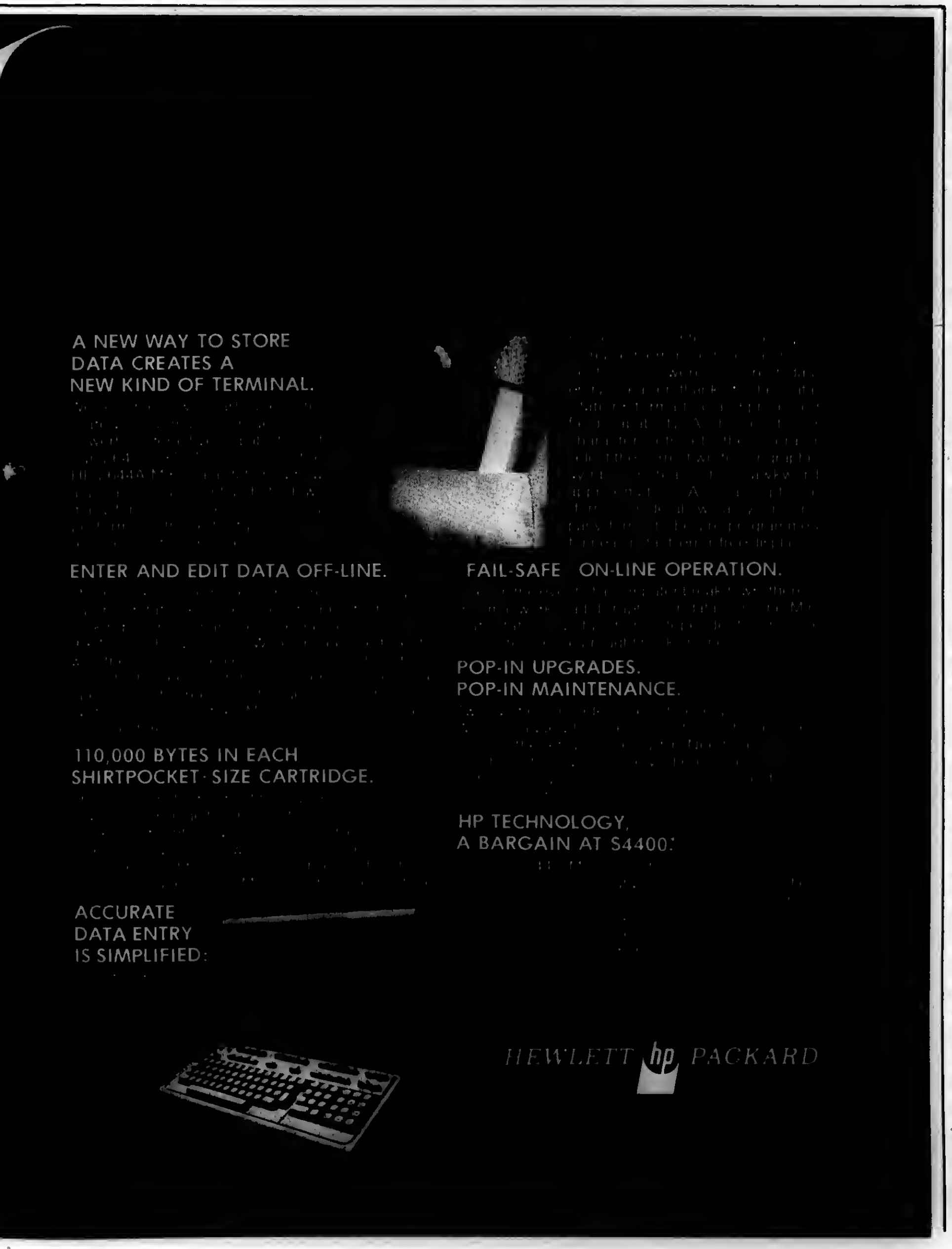
The "53" (pink card) which will become the final sales record, requires the use of virtually all 96 punch positions to retain all final sales information including customer name and address.

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Mailing lists generated by the system can be prepared in any configuration; by type of product sold, date of sale, by store, zip code, etc. It also serves as a customer service tool, enabling immediate retrieval of pertinent information for insurance purposes should a camera or other expensive piece of equipment be lost or stolen from a customer.

Most important, it provides Harrar with an effective inventory control operation with minimal use of computer time and cost.



Complex System Unneccessary

User Data Input Proves Economical in Small Network

By Charles W. McKellar
Special to Computerworld

NORTH KINGSTON, R.I. A common belief held by small- to medium-size DP shops is the use of key-to-disk, key-to-tape, etc. is only justifiable in large installations.

This belief is particularly valid in those small shops (five to 10 machines) in which a portion of the data entered is through turnaround documents such as job packets, etc.

Although some data entry systems are economically justified when as few as five machines are replaced, there remains a significant number of users who, while having made significant progress in the area of computer applications, have failed to make use of available hardware to improve the flow of incoming data particularly that data required to update major files.

Shortly after we installed our first CRT terminals, a problem which had always been present became more pronounced. Once the users had the capability to view firsthand the contents of a given inventory, structure or routing record the timeliness of the data in the file became more crucial.

Maintenance to the various files had to be submitted in sufficient time to permit keypunching and verification prior to the scheduled maintenance run that night or be delayed until the following day.

This required the establishment of an unrealistic cutoff time for all maintenance data.

In reviewing our procedures and exploring alternatives, we felt that not only were we in DP not providing the level of support required by the users, but were, to some degree, adding to the cost of data entry by requiring input data be transcribed to special forms which were designed to aid the keypunch operator.

CRTs Correct Problem

The CRTs installed to support the data base inquiry system, by the very nature of the application, were subject to random usage with frequent periods of idle time. But the CRTs also appeared to be the logical vehicle to correct the condition.

Basically, we provided a relatively simple system which permitted an operator to place the CRT in a data entry mode and display a menu from which to select the format of the data to be entered.

The selected format was then displayed. All fixed data was displayed, along with indicators of the blanks which were to be filled.

The completed screen, when transmitted, was written as an 80-character record on disk. Procedures included an easy restart procedure, security codes and audit trails.

Minimal Bells and Whistles

The system was developed as a straightforward accumulation of incoming maintenance data. The use of whistles and bells were minimal and the system performed only limited editing. The audit list also punched the accumulated transactions which were then processed normally.

The system, while not sophisticated, filled a very real need on the part of users while reducing overall data entry costs.

The CRTs which were installed for the purposes of file inquiry, were readily available to the user to enter data. No longer was data transcribed, keypunched and verified prior to processing.

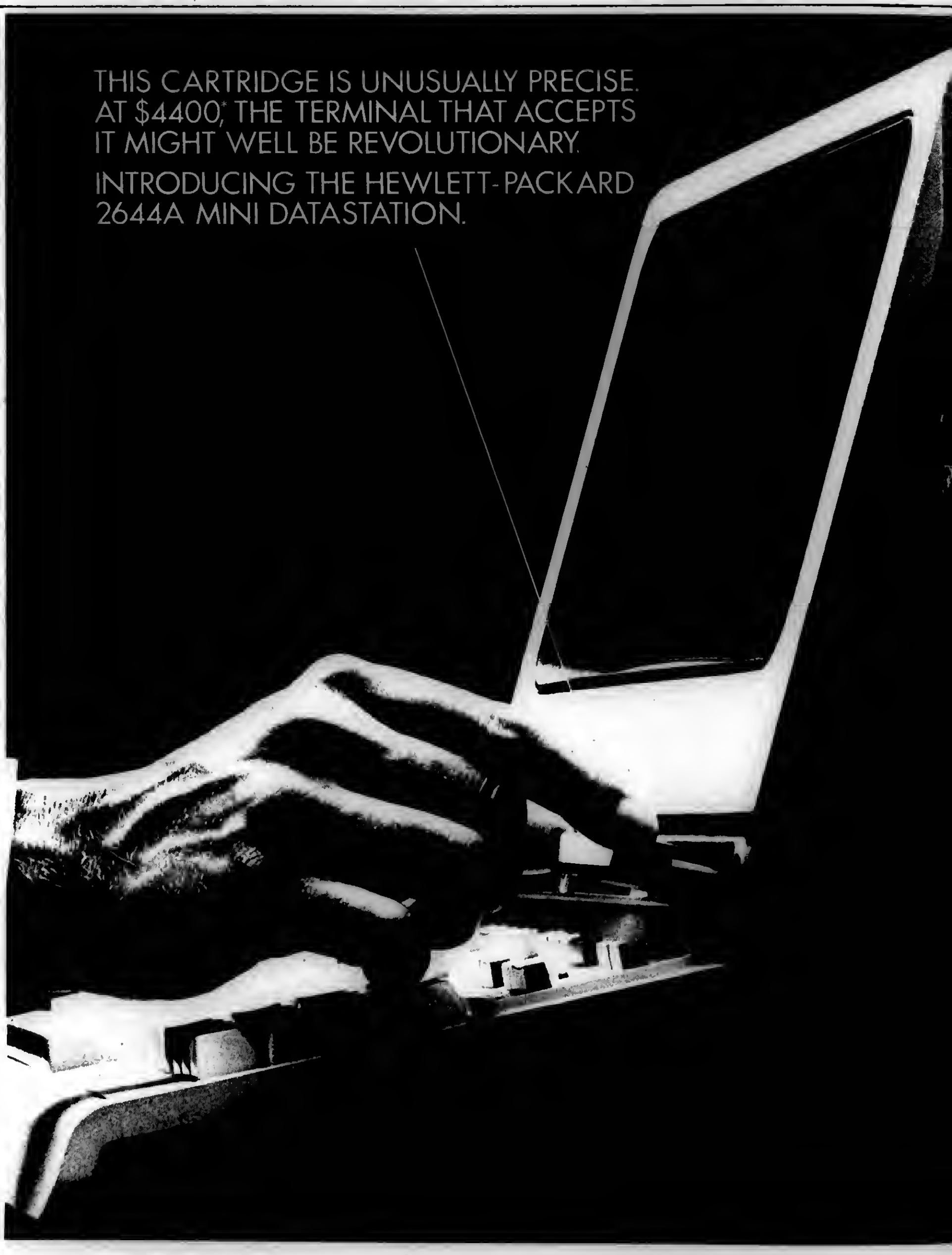
The acceptance of the system is evidenced by the number of transactions which are now entered directly by the user. The premise that no one knows his data better than its owner has proven valid.

Costs have been reduced while providing better service which, after all, is the name of the game.

During the next few months, we will be converting from Bunker Ramo 2206 local terminals to Sanders 8170 series terminals. At that time, we will expand our system to include Turnkey Associates' Keymaster, a key-to-disk system which operates under control of Turnkey's Taskmaster and is designed to use installed CRTs as entry devices.

McKellar is manager of data processing for Brown & Sharpe Manufacturing Co.

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INTRODUCING THE HEWLETT-PACKARD 2644A MINI DATASTATION.



Card-Based Inventory System Keeps Retailer Informed

Special to Computerworld

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In Necessary Time Frame

System Helps Firm Capture Television, Radio Ratings

By James R. Harry
Special to Computerworld

BELTSVILLE, Md. – To a firm which is one of the nation's largest broadcast audience-measurement companies, contacting more than 1.3 million families a year to determine program ratings, the input of raw data is no simple task.

The results are the basis of the Arbitron television and radio rating reports. The raw data is obtained from random computer-selected households by a small booklet called a diary.

The diaries are sent to each individual age 12 and over in homes selected for radio surveys and for each television set in homes selected for television surveys. Our problem has been and continues to be the capturing of the data contained in these diaries.

Speed is of the essence in retrieving the diary data, since data gathered in radio and television surveys becomes less usable as it becomes older.

While speed is important in building the system, accuracy in capturing the data is vital to our more than 2,700 clients.

Drain on Resources

In a 30-day period, keypunch techniques generated 1 million cards that had to be read and validated by our computers and then updated with appropriate corrections.

This process was becoming a drain on our computer resources at the same time that our processing demands for other revenue-producing tasks were at their highest levels.

By January 1974, this requirement for computer cycles, together with the steadily rising cost of labor and cards, provided the thrust which led us to investigate available data entry alternatives.

First we outlined the basic goals a data entry system had to meet:

- Reduce dependency on the installed computer base.
- Provide heavy on-line editing capabilities of pertinent data.
- Eliminate hand editing of tasks done by the computer.
- Maintain the current entry levels per hour worked.
- Maintain accuracy levels consistent with the prior system.

It took a full year to complete our study of available data entry systems and to receive management approval for the recommended system.

The majority of the systems we studied would satisfy all but the on-line editing demands without major reduction in our system's capability. CDC's Cyberdata system satisfied every criteria.

Prior to placing our order, we spent two months at CDC's Minneapolis plants, writing user routines and testing the system.

We concentrated on our on-line editing criteria and the corresponding response time associated with the heavy I/O demands.

The results of this two-month period culminated with our order of three 16-terminal systems with delivery scheduled for last July.

Between order placement and equipment delivery, we continued testing the user routines on our own previously installed computers and on CDC's Cyberdata test system in Minneapolis.

The systems arrived on schedule with the first machine installed and operational within three days. Months of preliminary testing proved to have been well spent.

It took us only one week after the system was installed to build our files and begin operator training.

We have now completed processing our first Arbitron survey using the Cyberdata system. The production cycle was 35 calendar days, consisting of over 50,000 diaries containing approximately 2.5 million entries, constituting 30 million data elements.

And error rates, as calculated from extensive internal audits, were below prescribed standards.

Harry is director of operations at Arbitron.

Time-Sharing Speeds Bank's Data Entry

By Gerald J. Vorndran
Special to Computerworld

CLEVELAND – Probably the most important data entry area for businesses is payroll. And here at the Central National Bank, payroll data entry for many of its customers is being converted to "payroll time-sharing data entry."

Central National Bank, which offers customer service payroll processing, embarked on a joint venture of payroll time-sharing earlier this year with Datalogics, Inc., a time-sharing vendor.

Before payroll time-sharing, the bank's payroll customer recorded his input on preprinted forms, a computerized turnaround document or on actual time cards.

The input was then transported by the customer to one of Central's branches in a locked payroll case. Through the bank's interoffice messenger system, the payroll arrived at the bank's data center.

Within the data center and the Customer Service Division, the payroll was keypunched, key verified, computer edited and reconciled.

If errors or an out-of-balance condition existed, corrections were keypunched, and the payroll was computer edited and reconciled the second time before the final production run.

Subsequently, the finished product was delivered to one of Central's branches where the customer would pick up his completed payroll.

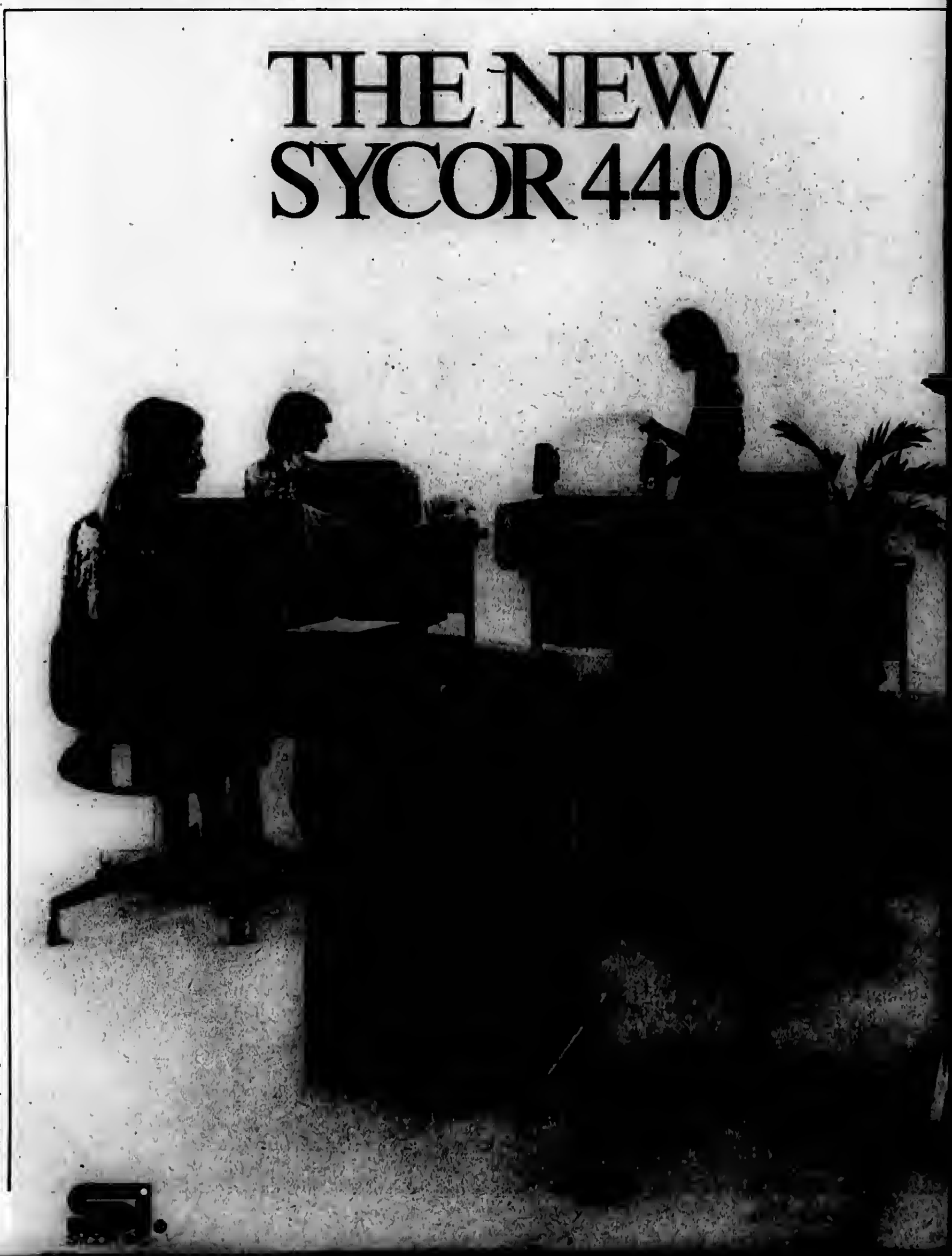
Time-Sharing System

Under the payroll time-sharing system, the payroll customer submits input through a CRT terminal over normal telephone lines to the time-sharing computer site. A 130K edit program and a disk mini master file are used to validate employee numbers and other pertinent information.

The customer's payroll clerk has visual

(Continued on Page S/13)

THE NEW SYCOR 440



Source Data Entry Eases Patient Admissions Process

By John Hebert
Of the CW Staff

PONTIAC, Mich. – In any hospital, patient care doesn't necessarily begin or end with physical remedies.

A medium-size hospital here has improved total patient care by using intelligent data entry terminals to capture complete and accurate patient information in one procedure – at the source.

The hospital has also eliminated the need for a time-consuming insurance-form education program for admissions employees, reduced patient billing times, forestalled personnel increases and improved its cash flow.

St. Joseph Mercy Hospital installed the terminals in the admitting department last June, Jerry W. Hendrickson, the hospital's director of DP, said.

"The hospital expanded from 300 to 500 beds about three years ago, and some growth is still being experienced," Hendrickson said.

"The work volume from that size increase also has increased substantially. For example, there has been a 15% to 20% increase in outpatient admissions alone," Hendrickson said.

The hospital now receives 20,000 inpatient admissions annually, representing 160,000 patient-days, he continued.

Burdensome Process

The increased time involved and errors made in the transcribing process for this increase in patient information was burdensome, he said.

Before installing Mohawk Data Sciences Corp. (MDS) 2300 source document-processing terminals in the admissions department, the hospital relied on IBM 129 keypunches to process patient-admission, services and billing information, Hendrickson said.

"Everything that was once on the 129 keypunches we now do on our key-to-disk system," Hendrickson said.

Six MDS 2300s have been installed in the admitting department; three are in inpatient services, and another three are handling centralized emergency and outpatient admissions services.

The terminals are connected by dial-up telephone lines to four MDS 1200 keystations, which are connected to an NCR 200 CPU in the DP department.

Each terminal has 116K characters of storage which is used to execute user-written form description programs specifying processing requirements for each form type used in admitting a patient.

Admissions Procedure

Whenever possible, the patient fills in a preadmission form at home. On the day of admission, the admissions clerk sits with the patient at a terminal with a CRT screen both can read. The clerk then types the multipart admission record, questioning the patient about missing information such as guarantor or insurance coverage.

The terminal is programmed for mandatory entires, forcing the clerk to provide complete input. The terminal's CRT prompts the clerk for all pertinent information.

Under the manual system used previously, the time-consuming admission process had to be repeated over 400 times daily as each new patient entered the inpatient/outpatient departments. And discharged patients typically waited about 13 days before receiving a final statement of their complete charges, Hendrickson said.

It had taken two days for admissions personnel to fully complete the 15 multipart forms the hospital needs for each patient admission.

The forms were then routed to the patient accounting department, where operators took one day to transcribe the information for the DP department.

The information was in DP for five days, mainly because of the volume of paperwork which had to be completed. The DP department had to keypunch nine cards per patient, Hendrickson said.

After the information was loaded onto the CPU, it was processed and posted to the billing department, where the itemized bills were processed for five days after the patient had been discharged, he added.

The terminals have helped to cut about seven days off the billing cycle because the several steps required to admit and process the information on each patient – typing, manual entries, card punching and file lookups – are now done in one procedure.

The terminals have saved approximately 460 man-hour/mo in clerical work by providing immediate input to the computer.

Time-Sharing Speeds Bank's Payroll Entry

(Continued from Page S/12)

access to what is entered plus computer editing and balancing totals capabilities.

Any entry which previously could be submitted on an input form can now be transmitted, edited, changed, deleted or corrected with the CRT terminal.

All input submitted by the customer's payroll clerk may be transmitted over a period of several days at customer's convenience and without time constraints.

At a prearranged time, the payroll data at the time-sharing computer site is gathered on magnetic tape and sent to Central's data center for the final production run and normal disposition of the finished product.

This system was promoted by the ever-increasing volume of keypunching, especially during peak periods of production. But payroll time-sharing eliminates keypunching and eliminates computer site reconciling; more important, it reduces the computer site turnaround time of payroll completion by 50%.

This turnaround time is of vital importance to payroll customers. Time-sharing allows the customer more time for payroll preparation and provides overnight completion of the final product.

Who knows a customer's payroll better than the customer himself? The customer, aided by the CRT and the computer, has complete control over his payroll.

Although this system is capable of handling any size payroll, it is primarily designed to supply maximum benefits to medium and large input volume types of payrolls.

Vorndran is a manager of automated customer operations at Central National Bank.

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Shared file access.

The 440 system lets you share and access files locally, reducing investments in telephone communications and central CPU resources.

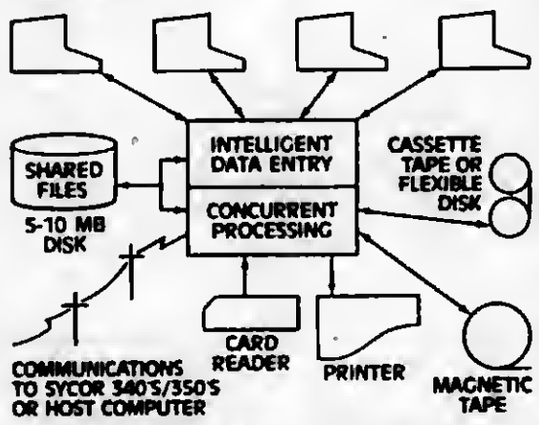
Data entry made easy. Now each operator, at her own display, can make use of current data in shared files to support data entry functions. For reduced keystrokes and lower error rates.

Inquiry/Response. File look-up is made simple with up-to-date information on-site, using the 440's own file management and disk storage capabilities.

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Design your own system with a variety of options and peripherals.

Supports from 1 to 8 displays. Each is controlled by the Sycor processor and is capable of performing tasks independent of other displays.



Choice of 5 and 10mb disks. Store and retrieve programs, shared files, and data at remote locations.

Wide variety of peripherals. And to complete our system configuration, choose from matrix and line printers, computer-compatible tape drives, card readers, and a variety of communications options.

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There's full software compatibility with our Model 340 and 350 stand-alone terminals. Keyboards are also compatible.

Programming. One program fits three different systems—340, 350 and 440.

Communications. Communicate with the mainframe, emulating IBM 2770, 2780 or 3780 protocols. Or use the 440 as a polling station at your central computer site to receive and transmit data to remote 340s, 350s, and 440s.

Concurrent processing.

And best of all, while data entry is being performed in the foreground, you can be doing other jobs concurrently in the background. Jobs that can save you time and money. Jobs like:

Remote job entry. Use the 440 with its card reader and 300 LPM printer for large-scale remote job entry. And since the system contains a CRT and a keyboard, you don't pay extra for them.

Multi-terminal printer support. Each display can interleave print data to one printer as the data is being entered. So, you don't need a separate printer for each display.

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File maintenance. And the Sycor 440 allows you to do editing, sorting, updating, and file transfer in a background operation.

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Intelligent Terminals End Firm's Training Problems

Special to Computerworld

ORANGE, Conn. – The installation of intelligent terminals has proved an invaluable asset in overcoming problems training field personnel in data entry for at least one company.

In addition, Saab-Scania, a Swedish car manufacturer, has been able to realize cost savings of better than 40% over previous costs for data transmission.

Saab-Scania has four regional offices located in Torrance, Calif.; Dallas; Chicago; and Jacksonville, Fla. Corporate headquarters here also serves as regional office for the Northeast.

The field offices are equipped with 8K Datapoint Corp. 2200 intelligent terminals with dual internal tape cassettes and with associated 120 line/min printers. Integral communication adapters and the dial-up network connect these units with the home office.

For data collection from these offices, the home office also uses a 2200 which is equipped with a 7-channel 556 bit/in. magnetic tape-to-cassette conversion unit. Transmission is cassette-to-cassette, and the filled spool is then converted to tape and read into the home office computer.

This network, used primarily for data entry from field offices and for transmission of management reports back to these field offices, fronts a Honeywell 1250 configuration in the Orange facility which is used for the company's general DP requirements.

"Our business at Saab-Scania is automotive sales," Martin R. Doyle, DP manager, said. "We have in the U.S. an organization of 450 dealers which we support through our four regional offices and our national office here. The primary field data inputs we get from our field offices concern dealer car sales and dealer orders for parts.

Parts Ordering Critical Task

"As with any car operation, parts ordering is, in particular, a critical and complex task, since we stock over 16,000 items. We use the Datapoint equipment as the means to get correct order information to us here swiftly, to process that data, make sure the goods are delivered as requested and, in the case of car sales, turn the data around back to the field in the form of usable, timely management information," he said.

Before installing the Datapoint equipment early in 1974, Saab-Scania used standard key-to-tape entry gear for data entry in its regional offices.

"A particular constraint with this equipment concerned the training of operators. Our field offices are not heavily staffed, and it was extremely important that we find qualified personnel and train them for the key-to-tape units.

"This training process might take as much as three weeks. If an operator left the company, that meant our operations were hampered until we could locate a new person and train him for the equipment," Doyle stated.

"With Datapoint, however, the training process is almost entirely avoided, thanks to the unit's video display and the way in which we can program a sequence of tutorial 'stages' for data entry. The operator is literally hand guided through the entry process and, should he make a syntactical or in many cases a numeric error, the machine will signal that an error's been made. I myself have trained an operator from scratch to an acceptable level in just 15 minutes," he said.

The Datapoint equipment has also been of key help in reducing data transmission costs over the telephone facilities used by Saab-Scania.

"From 1973 to 1974 the line costs for data transmission at Saab-Scania dropped over 45%, even though our volume increased," Doyle noted.

The reasons for this are three. First, the data communications is strictly from machine to machine, so we don't have the problem of personal conversations at company expense.

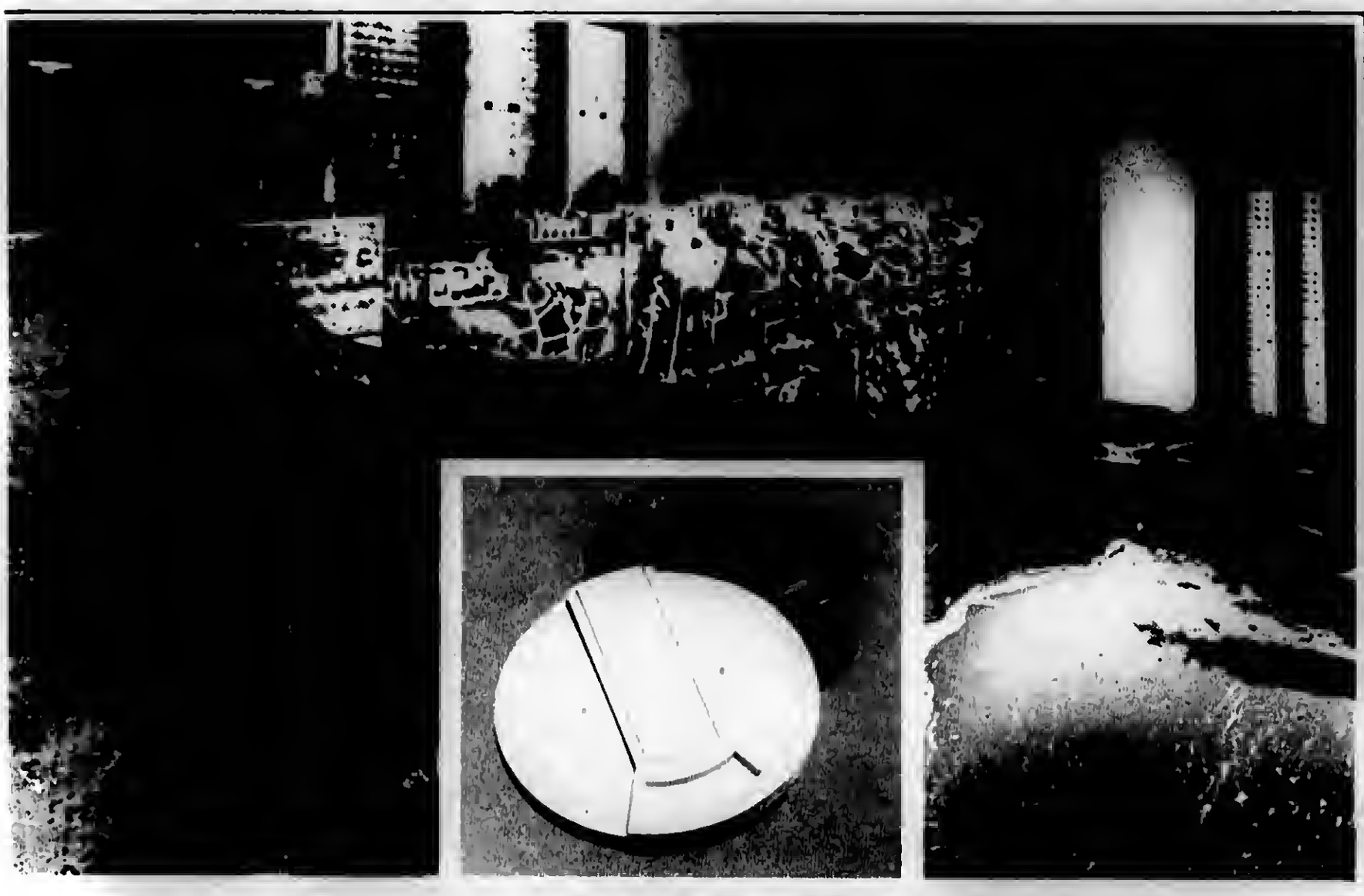
Second, in the event of carrier interrupts, the machines are programmed to automatically redial and recommence transmission from the point where the interruption occurred, not from the beginning of the transmission as was previously the case.

"And third, the terminals are programmed to handle much of the data transmission unattended and automatically overnight when telephone rates are the lowest," he said.

"We find our network especially useful in getting action management information into the hands of company executives. For example, our 10-day car sales reports are prepared on our central computer and then transmitted to our regional office managers on the 11th day morning, and this is a most useful action document for our field managers.

"Similarly, we speed new car order information from the car order system direct to regional offices through the network," Doyle commented.

While data entry and data transmission applications form the hard core of the dispersed DP network's current usage, Saab-Scania also is using the extensive local processing capability of the 2200s.



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With Automated Order Entry

System Expedites Shoes to Salesmen

HANOVER, Pa. – More business means more work, but it also means more planning – planning which often leads to the acquisition of new computerized equipment to speed operations.

In the case of Hanover Shoe, Inc., increased sales led to the acquisition of a computer-assisted data entry system.

The bulk of the company's Direct Sales Division's work is with thousands of individual salespersons all over the country.

These salespersons work on a door-to-door basis, writing orders for Hanover-brand dress, casual and work shoes and sending them to the company's headquarters for processing, according to Allan T. Young, the firm's DP manager.

"That's where the work begins, and that's where direct sales would have one day been in a serious workload crunch, if it hadn't been for new order entry procedures," Young said.

"Orders are received daily, and since 1973 when the division was started, the inflow rate has risen from a few each day to hundreds, sometimes thousands," Young explained.

Foresaw Crunch

But, foreseeing the crunch, Hanover management turned to its data processing department to come up with a plan to avert it.

"The original routine for handling orders was a manual one. Clerks received sales slips; compared them with the Hanover catalog for style, size, width, color and price; verified order accuracy and cash; and sent them on their way," Young said.

Next, the orders were processed on a proof and billing machine, where applicable state taxes and postage were entered, and the orders were totaled, filled and mailed.

Although the system then used was manual, it was effective. But, as sales continued to grow, paperwork mounted and personnel needs pressed.

"Success of the division hinged on responding to field sales' needs," Young noted. "Turnaround time has to be as short as Hanover can make it.

"After all, consumers don't have to buy shoes from one of Hanover's representatives if delivery time is too long. They can always go to a nearby retail outlet, and that would defeat the purpose the company's Direct Sales Division."

"One way we considered absorbing more of the growing workload was to have clerks keypunch the information from sales orders and run cards through the company's central computer system overnight," Young explained.

But punch cards also mean more paperwork, and they're costly; so that alternative wasn't the answer Hanover management wanted.

"Besides, punch cards take too much time, not only in actual data preparation, but in system throughput as well," Young said.

Faster throughput, then, was one quality Hanover's next order entry system had to have, "as well as the ability to take on more work without more paperwork and expand with the Direct Sales Division's demands," Young said.

Search Ends

The search ended in August 1974, when Hanover began converting to a computer-assisted data entry (Cade) system.

The system was a Sperry Univac 1900 Cade unit, which includes a self-contained central control unit, seven keystations, a disk drive and tape unit.

With the new system, operators enter order information directly into the central control unit from individual, remote keystations. Each keystation is equipped with a display that acts as a monitor for the operator.

As the orders are entered, each order is checked to make sure a legitimate style was ordered. Also, the proper tax, postage price, deposit and extended total are computed and compared with the keyed entries. Any differences are displayed on the keystation CRT. If the sales order is wrong, it is returned to the sales department for action.

At the same time, the supervisor can also monitor order entry activity of each operator as a backup measure. The supervisor transfers order files from disk to tape and delivers the tapes to Hanover's central computer facility at the close of each business day.

There, the information is processed overnight, labels printed and orders shipped the following day.

After a year of operation, Young has already compiled a list of benefits. "Of course, the major benefits to us will be Cade's ability to produce faster throughput and absorb more order demands in the future," he said.

"But there are others we hadn't considered at first.

"For example, there's no downtime with the Cade system. Combined with faster throughput, this means we're able to stay up with the job and keep the company's central processor busy overnight," Young said.

"The Cade system has unlimited data entry capacity, too, whereas with an 80-column punch card system for the application, data entry would have been limited. Each direct sales order record has 300 characters to it, which exceed a single punch card's capacity," he noted.



Seven keystations serve the Hanover Cade system. Alan T. Young, DP manager, is shown above.

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Personnel Training Results in Greater Cost Control

By Edward Singley
Special to Computerworld

Until recently the rapid expansion of the computer field and the great demand for technicians and managers caused the people working in the data entry department to be treated as low priority for training.

But management has been asking: "What does it cost to process data on a cost-per-person basis?" The answers have indicated a need for tighter cost control in the data entry area.

Inaccurate data entered into the computer and the delays caused by retrieving the information and reentering it account for almost half of each data-handling dollar spent.

To pinpoint the principal reason for inefficiency in this area, consider the people involved.

Many data entry personnel were part of their company's manual operation and received only cursory instruction by the system supplier when the company automated.

Others, hired with little or no training to their credit, were given a briefing by somebody on the job.

That simply is not enough.

Vast sums of money spent on sophisticated hardware, software systems and high-level personnel do not guarantee a company will get its money's worth – it has to dig deeper, to the data capture area, where computerized handling begins.

A company can determine whether its data entry department is profitable by instituting work measurement and standards procedures. This basically achieves:

- Individual operator production and efficiency increases.
- Total departmental production statistics.
- Accurate job load forecasting.
- Elimination of time-consuming clerical assessments.
- Accurate time and cost estimates for data preparation.

Proficiency Tests

A good way to measure an operator's performance is by giving him a proficiency test to discover his key depressions per hour (KDPH) performance in keypunch, key-to-tape or key-to-disk operations.

The test should be straight copy and measured so that the end of each line has an accumulative total of the number of characters stroked.

To arrive at the number of KDPH for a 10-minute exercise:

- Count the number of key depressions of the last line typed by the operator.
- Add the total number of key depressions from the preceding line.
- Multiply by six to get the KDPH.

This method should only be used as a guideline, since one-third to one-half of an operator's speed is lost on production documentation. After all factors have been considered, operators producing 15,000-plus KDPH on alpha and/or numeric material can be considered reasonably well qualified.

It is not wise to consider keyboard dexterity alone. Emotional job fitness is just as important. An operator's attitude, posture, the physical environment, layout of the data entry department, job handling routines and distraction factors all contribute to the effectiveness or ineffectiveness of a production activity.

Attitude problems can be caused by an operator's lack of confidence in his skills. This has often been the case when equipment is upgraded; adaptation of methods causes confusion among operators when no more than cursory instruction is given.

Often, too, the layout of the department may not encourage a high level of production, and at times only a rearrangement of the equipment is needed to reverse this situation.

Job distribution can also be a problem if the operator has to continually collect his work from the supervisor's desk, thereby causing continual traffic between the machines and adding to other distractions.

Supervisor an Asset

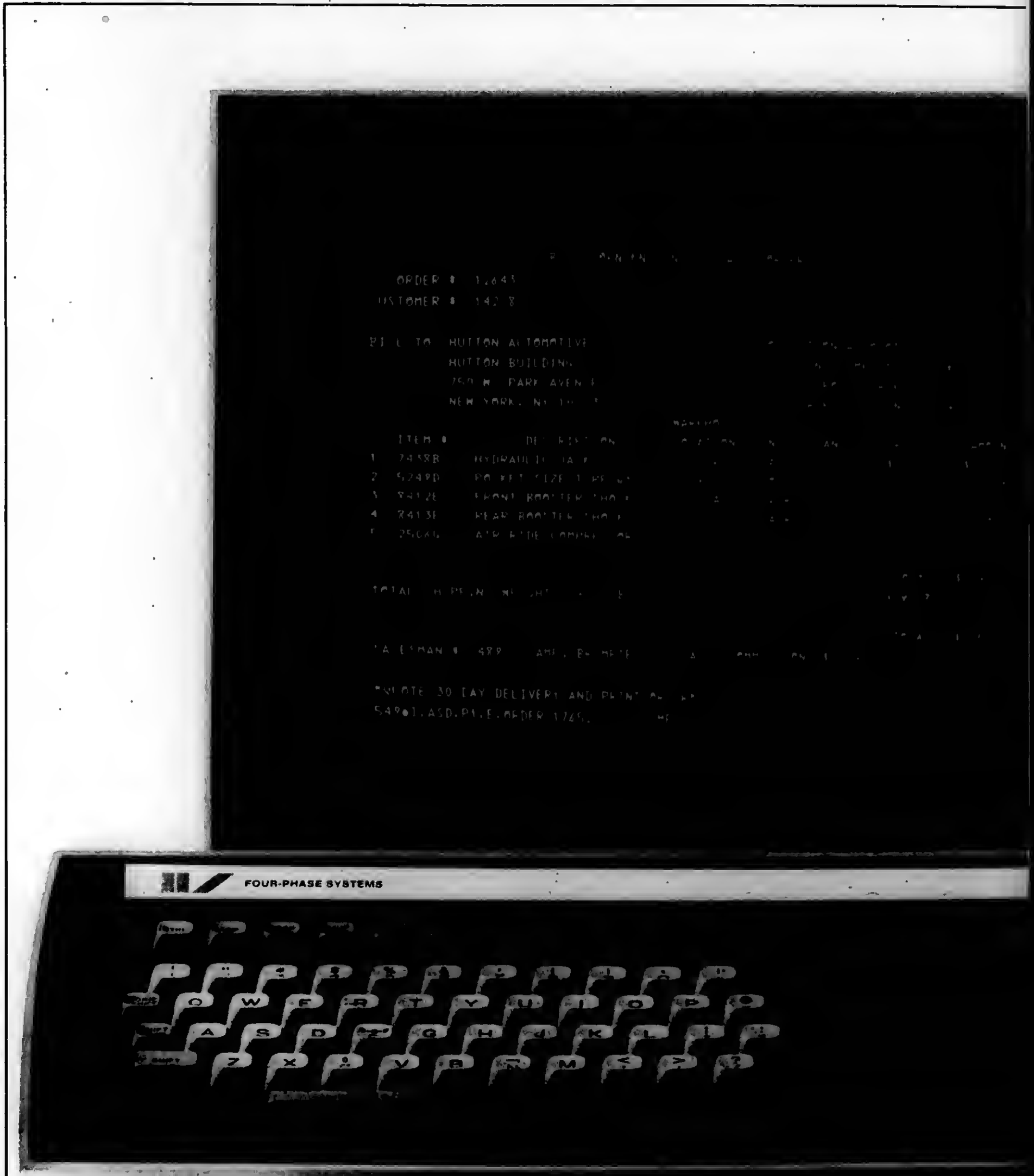
From a long-range view, the supervisor is a very valuable asset. Don't choose a person for this position because he happens to be the most productive on the machine; choose a person who is able to handle people and is well organized.

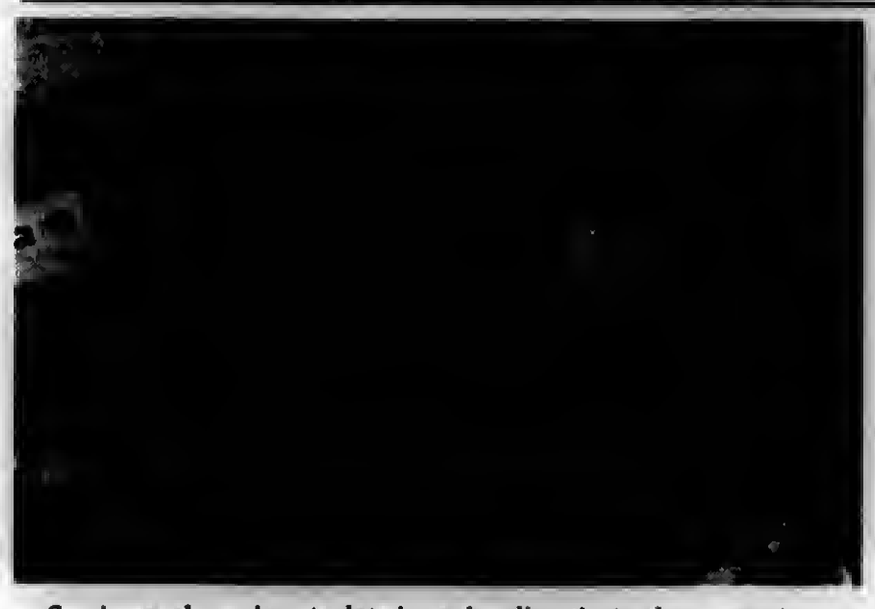
If training is given, the supervisor should work with the people conducting it so he can maintain the grades of the operators being trained and train future people. Let the supervisor control the work flow and distribute it to the operators.

Encourage the supervisor to have a brief discussion with each of the operators on a monthly basis to review their performance and develop their work needs: Is the CRT programmed to be most effective? Perhaps the fields could be placed in an improved position? After all, it is sometimes the operators themselves who know best what they need.

In addition to resolving the cost problems associated with data handling, training in the data entry area should also consider other factors which form

(Continued on Page S/17)





Service analyzer inputs data by voice directly to the computer.

To Capture Service Data

System 'Listens' to Analyzers' Input

Special to Computerworld

TECUMSEH, Mich. – Tecumseh Products Co. is using one of the latest methods of data entry – voice input – to improve its warranty management program.

Good system designers have always attempted to capture data in computer-compatible format at the source. Any elimination of redundant recording reduces costs and transcription errors.

In many hands-busy operations, it is not possible to key data at the source or manually encode it for later keypunching.

People who work in these environments have not been trained, nor are they qualified to perform keypunch operations, and neat handwriting is not a prerequisite for the job.

In addition to manually recording data, this information must be keypunched, creating an unnecessary step.

At Tecumseh, unit analyzers working in the service department communicate their data directly into a computer via voice data entry.

Refrigerant compressors manufactured by Tecumseh are sometimes returned for service analysis. In order to classify the type of compressor, customer and other pertinent data, each service analyzer speaks data directly into a microphone via Threshold Technology, Inc.'s voice data entry system.

The information required from analyzers is basically the same as in the past; however, the handwriting of that data has now been eliminated.

When the analyzer evaluates and compiles the data from the refrigerant compressors, he is, in essence, dealing directly with the computer.

The Threshold system accepts the spoken word and outputs the data into a computer-compatible format. The data processing system then converts the data to documents for mailing to Tecumseh's customers.

Display Prompts Operator

The operator wears a microphone for voice input and has a small interactive alphanumeric display for verification of his input as well as feedback and next-step information. The display works with the operator telling him what information it wants next.

The operator sees the message that is displayed, looks at the metal tag on the compressor, and speaks the data into the system. If he discovers a mistake via the verification on the screen, he simply says "ERASE" and reenters the proper data.

The voice data entry system also performs contain checks and comparisons (such as date of manufacture vs. warranty claims

(Continued on Page S/19)

Training Results In Cost Control

(Continued from Page S/16)

part of an integrated and cohesive department:

- Job codes: This entails defining the work once it is received into the department and establishing methods for passing it through the system as quickly and effectively as possible.
- Definition of data requirements and source documents: The result is to ensure compatibility between data input requirements without excessive expenditure for systems modifications.
- Study of work flow: This involves studying each job performed in the department and arriving at a method so that any task will be performed at its optimum level.
- Streamline input procedures: This relates to the task of examining material before it reaches the data entry department. In some areas these functions need restructuring to perform productively.

Singley is manager of the Commercial Division at Advanced Keyboarding Systems, Inc., a data entry operator-training company.

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Instant access of obsolete data isn't very useful. That's why we've given Version 3 online update capability. Now all your operators can access the same current information. As each transaction is keyed, master file records can be updated *automatically*. For example, when new orders are entered, inventory records can be updated to show the reduced quantity on hand. And when warehouse receipts are entered, inventory records can be revised to show the newly arrived stock. It's all automatic with Version 3.

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Used in Statistics Gathering

Key-to-Disk Helps Keep Score for Automotive Industry

CINCINNATI – Greater efficiency, lower costs and fewer errors are the advantages R.L. Polk & Co. here has experienced since it switched to automatic editing to prepare data for its large computer system.

Known since 1922 as the "scorekeeper for the automotive industry," the Cincinnati Division of Polk now is using two key-to-disk data entry systems rather than electric typewriters, preprinted forms and optical scanning equipment.

The division gathers, tabulates and stores data on the more than 11 million new cars and trucks purchased each year in the U.S. and Puerto Rico and then prints monthly and special-order statistical reports for car and truck manufacturers.

Data is gathered from state vehicle registration information.

"We eliminated the checking and scanning operations in our former four-step process by swltching to the Inforex 1302 system about two years ago," according to Thomas V. Maloney, vice-president and general manager of the division.

"The system has enough logic to provide a validity edit of the very information we need – the factory-assigned vehicle identification number for cars and the manufacturer's gross vehicle weight for trucks," Maloney said.

The division inputs more than 20,000 records per day on its two systems, which have a total of 20 keystations. The two systems are dedicated exclusively to inputting data on cars and trucks and are used on a single shift, Maloney said.

"The operators first key in the 13 to 16-character vehicle identification number, then the vehicle data, including year, model, make and series," Maloney explained.

"Then the operator again keys in the ID number, which is matched and validated by the logic in the system before the entire record is accepted.

"This is a two-step process," he said. "Previously, we typed the information onto a preprinted form, checked and edited it, then ran it through an optical scanner to transfer the data to tape.

"We've eliminated two steps and also made the checking, editing and correcting functions much easier with the system."

"When we switched systems, we brought down the cost of data entry appreciably," Maloney said. "We eliminated the forms, checkers, control clerks, scanning and other costs."

The dedicated key-to-disk system also has produced greater efficiency and higher production – for a couple of reasons. The equipment is easy to operate; errors are easier to correct. Both of these factors add to productivity.

The division also pays its keystation operators on an incentive plan, adding a bonus to the paychecks of about three-fourths of the operators because of their fast, accurate keystroking.

"With more keystrokes per hour, we win in production and the operators win in additional money," Maloney explained.

The magnetic tapes produced by the key-to-disk systems are loaded onto an IBM System 370/158, which processes all the data for the division.

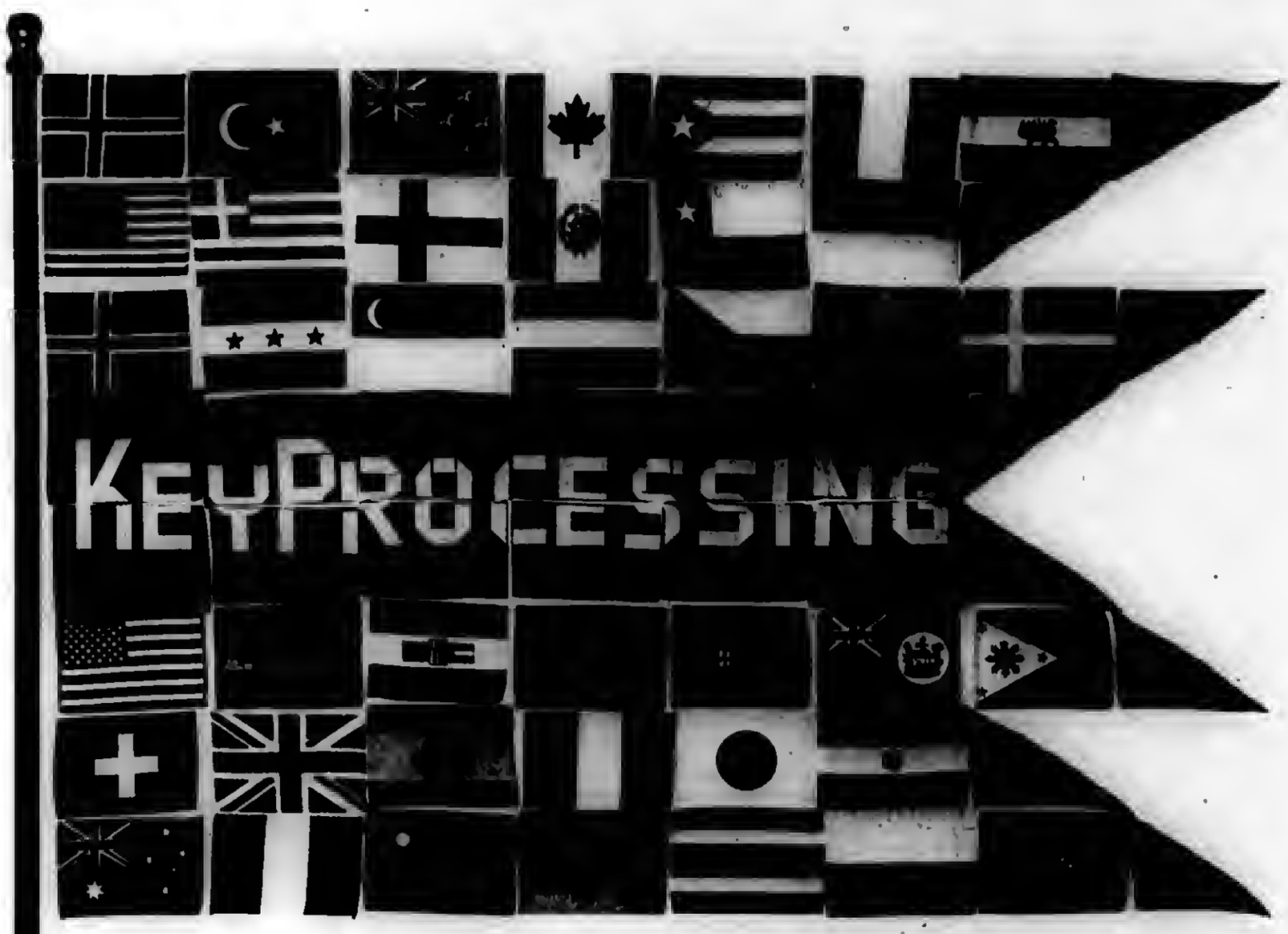
The standard statistical report produced from the vehicle registration data is a monthly census by cities of cars and trucks registered by manufacturer, model, series and price class. Trucks are listed by manufacturer's gross vehicle weight by manufacturer.

Check Sales Performance

"This is the data base we work with," Maloney said. "Half of the reports we print each month are for specific car divisions.

"Companies then can analyze performance by marketing areas, sales zones or geographical areas. This data helps the manufacturers in their production planning and marketing."

The source material is computer magnetic tape and microfilm copies of vehicle records. "We only keystroke those that are not provided on computer tape," Maloney said. "The tapes are edited by us and changed into our format."



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Moving Data Entry to Source Lowers Firm's Cost 39%

By James L. Downs
Special to Computerworld

KAUKAUNA, Wis. – Switching from keypunches to IBM's 3740 key-entry system gave Thilmany Pulp and Paper Co. a 70% increase in volume with a 48% reduction in labor hours – and the total cost for data entry is now 39% less than in 1972.

In the early 1960s, Thilmany installed a unit record system for accounting and manufacturing applications. The number of people involved in the operations end of DP grew from six in 1963 to 12 in 1967 when an IBM 360/40 was installed.

As one would expect, the growth was principally in the data entry section.

By March of 1973, the data entry section consisted of eight full-time and three part-time data entry employees working two shifts, producing approximately 50 million strokes annually (equivalent to about 500,000 cards punched and verified).

This work was being done on seven IBM 129 keypunches. The approximate cost for data entry was $70,000/year at year-end 1972. The total labor hours in data entry was 17,500 for the same year.

Installation of 3740

In the spring of 1973, Thilmany made the decision to install the IBM 3740 system in its data entry section. The original concept was to initially install the devices centrally, but eventually move them to other departments for direct entry by the user.

This system has had a tremendous effect not only on the efficiency of entry, but also on the user in receiving information on a more timely basis.

The initial installation was on a one-for-one basis; for each IBM 129, one station of the IBM 3740 system was installed. Approximately one month prior to the planned conversion date, a single station was brought in and the data entry supervisor was trained.

During the next three weeks, all applications (currently 244 different ones) were converted to the IBM 3740 format and documentation changed. Additionally, all operators were given some general training on their use.

Over a weekend, all IBM 129s were removed and IBM 3740s put in place. On a Monday, all data was entered through this system and, by Wednesday, all was proceeding smoothly. Since that time, the data entry staff has been reduced by attrition and transfers to four full-time operators and no part-time help.

While the staff size has been reduced and all work is being performed on one shift, the volume has grown from 50 million strokes to 85 million yearly.

The data entry operators now produce an average of 17,500 stroke/hour with some applications as high as 30,000 stroke/hour. The total labor hours forecast for 1975 for 85 million strokes was 8,500 hours.

The approximate cost for data entry in 1975 is $43,800 or 39% less than in 1972.

In July, Thilmany converted one of its IBM 3740s to the programmable version and began development of the first decentralized data entry applications – payroll and daily labor reporting and journal entries.

One of these applications is now installed and the other will be installed by year end and will afford Thilmany even further savings in time and improved throughput.

The current thinking is that one day can be completely cut out of the period closing cycle, thereby allowing the executive management more time to analyze and plan for the future.

The main advantages of the new data entry technologies are that they:

- Afford more work with less people in less time, thereby reducing budgets and making the data center more of a tool.
- Free up space that had been needed to store cards (both blank and punched). Thilmany's space savings have been enough to house its seven-man programming staff.
- Make decentralized data entry (in the user location) now entirely feasible.
- Make the cardless data center practical.

System 'Listens' To Service Data

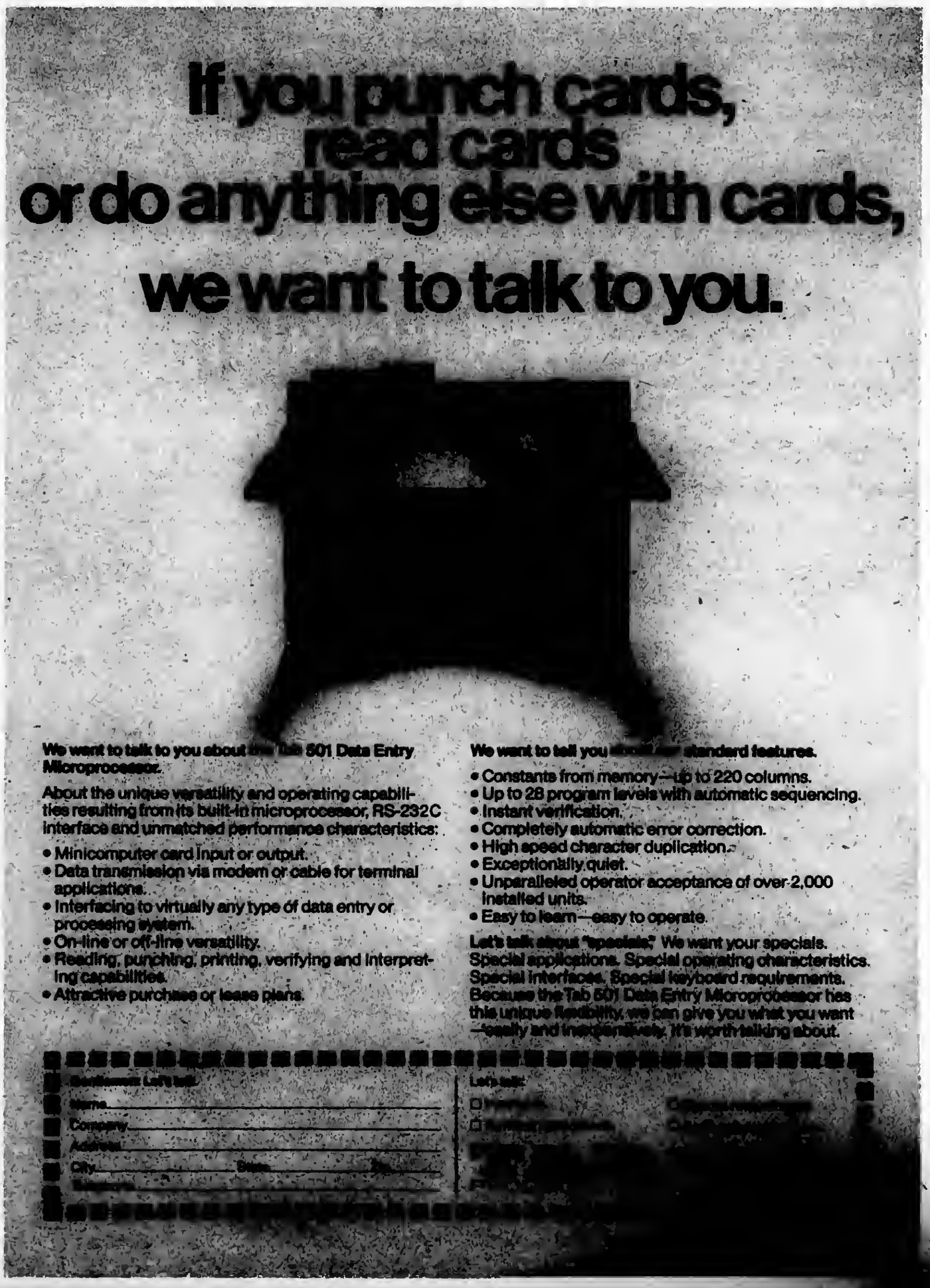
(Continued from Page S/17)

date) to make sure the data is correct.

Voice data entry permits hands-free disposition of the compressors. In addition, the data is now in computer format, and the keypunch department previously required for data entry has been eliminated. Credits due are sent to customers within two days.

Voice has increased the capability and throughput of unit analyzers so their prior two-shift operation has been reduced to less than one shift.

Tecumseh has been able to reduce the customer turnaround to a few days instead of weeks while reducing costs and improving accuracy.



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Bell Transaction II for Users Without Audio-Response Units

NEW YORK – A second member of the Transaction Telephone terminal family has been developed by Bell Telephone Laboratories.

The Transaction II terminal is for use in systems not equipped with audio-response units. It was designed for credit card authorization, check verification and other electronic funds transfer functions.

Transaction II has improved over the earlier version with an eight-character visual display, hands-free operation and the ability to operate both in a voice-only system and in a data-oriented system.

The features are in addition to those of the earlier model Transaction Telephone, which reads American Banking Association magnetic stripe cards, offers data access to a CPU and serves as a regular business telephone.

The display is a seven-segment type with eight digits for showing either locally keyed information or information received through the data receiver.

In addition to numerals, the unit can display some alphabetic characters, depending on the display characteristics and the decoding capabilities of the data receiver. The terminal includes a built-in modem.

Data Receiver

The data receiver was designed to receive control characters and characters for the display. Control characters include those for operating response lamps on the set and other functions, such as disconnecting or retransmitting data.

The data receiver operates at 150-, 110- or 75 bit/sec with frequency-shift keyed (FSK) data. Data rate is selected by a character on the dialing card.

Hands-free operation is accomplished with "on" and "off" buttons, a line control relay and a call progress tone sounder. The on and off buttons initiate and terminate calls, just as the switchhook does in the earlier version.

First tariffs for the Transaction II terminal will be filed by Bell System companies in April 1976. Rates are expected to be in the $25- to $35/mo range, an AT&T spokesman said.



AT&T Transaction II Terminal

Terminal Transactions

AM 'Fraudproofs' Mag Stripe Cards

LOUISVILLE, Ky. – Addressograph Multigraph Corp. (AM) has introduced a development in credit/debit card technology which it said makes magnetic stripe cards "virtually foolproof" against the most serious kinds of card fraud.

The company's Card Security Feature (CSF) affords "a high degree of protection to both card issuers and card-using consumers against counterfeiting, tampering and other forms of card fraud which today result in losses estimated to exceed $300 million per year," an AM source said.

AM's anti-fraud system uses randomly dispensed reflectors embedded beneath the magnetic stripe. When read by an infrared sensor, these reflectors and their position relative to the magnetically encoded data create a "fingerprint" that is said to be unique to each individual card.

A banking terminal's sensors can detect reflector positions variations of less than 1/1,000 of an inch, the spokesman said.

The card's electronic fingerprint is contained in the card issuer's central CPU memory. Only when there is an electronic match can a card complete a transaction.

The CSF is designed to be incorporated into AM's credit/debit cards and its Amcat credit authorization/electronic funds transfer terminals.

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COM perspectives from Kodak:

Understanding the economic impact of a Kodak COM installation.

The most cost-effective approach to COM is a lot easier to find now because of a Kodak service called PRINTCOM. It lets Kodak actually premeasure the savings you can expect, using your own cost figures, when you put a Kodak KOM-80 microfilmer to work in your EDP environment.



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Sweda's optical scanner reads UPC symbols regardless of the position of a supermarket item as it passes over the scanner.

Sweda Extends Series 600 POS Line

PINE BROOK, N.J. – The Sweda International division of Litton Industries has added another system to its Series 600 electronic point-of-sale (POS) product line.

Designated the Sweda 600/60, the system is tailored to offer POS automation, store-level data collection, processing and reporting to retailers requiring less extensive reporting capabilities than those provided by Sweda's earlier 600/80 system.

The 600/60 allows price look-up of velocity-coded items from all terminals and provides tabulations, by checker, from all terminals a checker may use. The velocity code provides smaller stores with an alternative to the Universal Product Code (UPC).

Terminal Transactions

Operation of the 600/60 controlled through "English" commands typed on the manager's console. The 600/60 is the only low-priced system available that includes a manager's console, a Sweda spokesman said.

The system provides store management with store-wide summaries, by terminal or checker, which can be obtained from the terminals at any time. The terminal summaries include such data as total sales; number of customers; cash-in-store; tax, food stamp and coupon totals; and productivity data.

In addition, the 600/60 provides item movement reports, daily or weekly storewide summary reports (by department and total for store), a daily or weekly cash report, store balance report, store activity report, a till status report (by operator or cash drawer), a coupon report and an operator balance report.

Uses Floppy Disk

The 600/60 includes the Sweda 600 terminal, 32K minicomputer, the manager's console and a 315K-byte flexible media disk system.

The system, which has a 150 item-price lookup capability and a 50-coupon lookup capability, can accommodate up to eight terminals. Options include a 9- to 16-terminal operation, negative check authorization for 2,000 accounts and communications to a host computer.

The flexibility of the 600/60 allows the system to be upgraded to the earlier 600/80, the firm said. The 600/80 system offers larger disk storage and software required for upgrading to Sweda's UPC scanning system.

The 600/60 system can transmit batched store data on-line to an IBM 360 or 370 or other CPUs using binary synchronous communications. It can transmit at speeds up to 2,400 bit/sec on dial-up or 9,600 bit/sec on private lines.

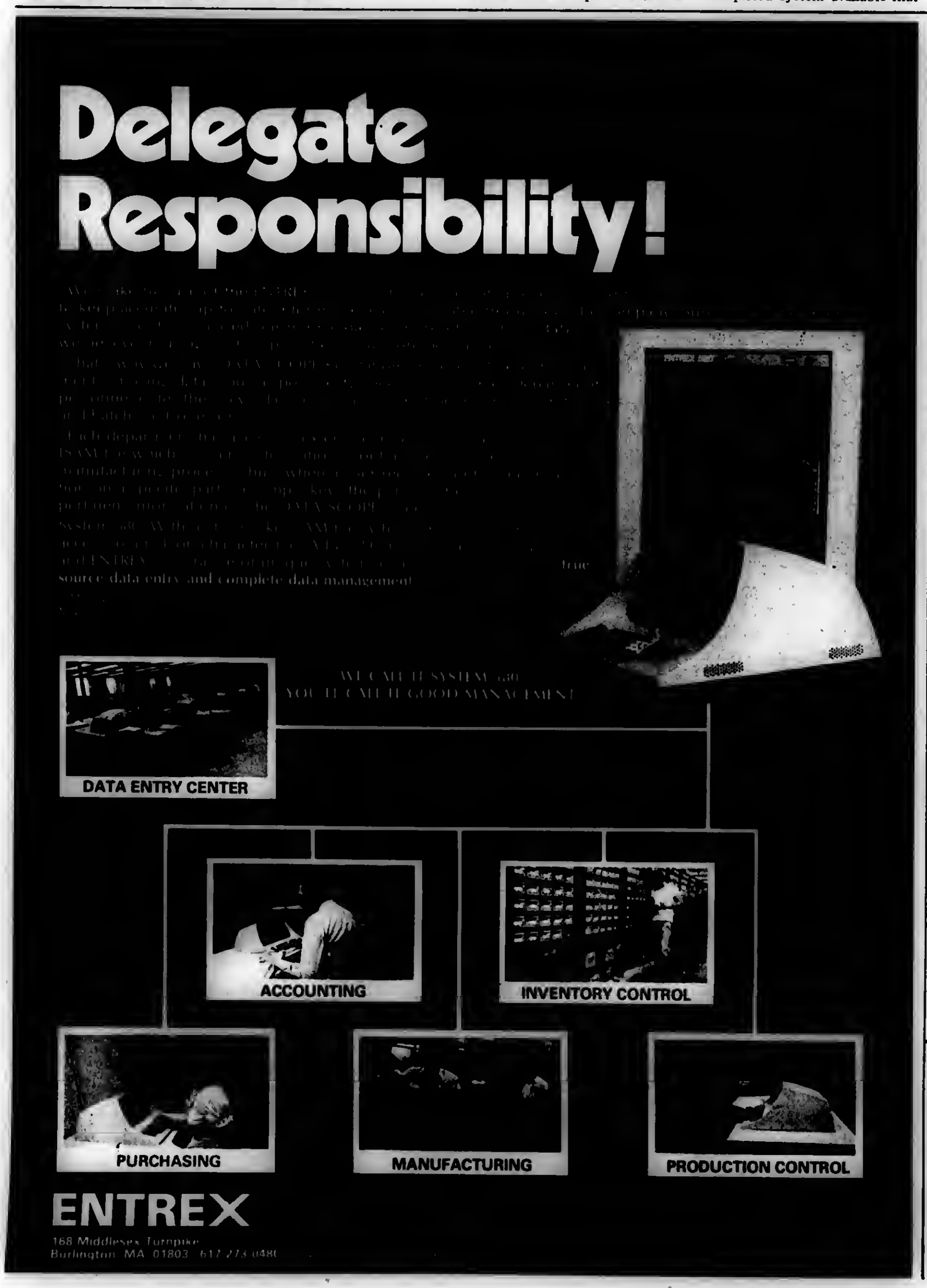
A typical eight-lane version of the 600/60 costs $33,000 for the processor and eight checkout terminals. First deliveries are scheduled for early 1976.

Omnidirectional Scanner

Sweda also introduced an optical scanner for its Series 600/80 supermarket POS system that reads UPC symbols regardless of the position of the products as they pass over the scanner at the checkout counter, the company said.

The fixed-head, omnidirectional scanner is said to be the only unit that will read the UPC symbol whether the bar code pattern is on the bottom, front, back or either side of the package.

The omnidirectional scanner is designed to sell for $3,950 with first deliveries in mid-1976, Sweda said from 34 Maple Ave., 07058.



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SYSTEMS&PERIPHERALS

Bits & Pieces

Grumman Ties IBM 1403s With Burroughs Machines

WOODBURY, N.Y. – Burroughs computer users can link their machines to IBM's 1403 printers with the G1403/Burroughs printer controller from Grumman Data Systems Corp.

The printer controller is plug-compatible with Burroughs computers utilizing a buffered controller to drive a B9240, B9241, B9242, B9243 or B9246 buffered printer.

The Grumman device comes in a stand-alone enclosure and includes logic cards, memories, mating connectors, power supplies and instructions, Grumman said.

The printer controller costs $17,000 and can be leased for $500/mo including service on a minimum one-year rental. Delivery is 90 days from the firm at 45 Crossways Park Drive, 11797.

Tab Cartridges Ready With Labels

PALO ALTO, Calif. – Tab Products Co. will supply its Easy Load II tape cartridges with Compucolor labels already affixed to match a user's sequential numbering series, the company said.

The user must order the cartridges in lots of at least 500. The labeled cartridges cost about the same as buying cartridges and labels separately from Tab, but save the user considerable labor costs, the vendor said.

Tab will continue to offer Compucolor tape ID labels separately.

Tab is at 2690 Hanover St., 94304.

Diskette Jackets Convert to Pockets

NEW WINDSOR, N.Y. – Standard diskette jackets convert to hanging file pockets in Monarch Metal Products, Inc.'s line of diskette storage units.

Self-stick "hang-its," supplied free with the storage units, attach to either side of the diskette jackets, supporting the diskette in the storage unit.

Monarch's 4126 storage module holds up to 100 diskettes in this way. The company's 4130 transporter holds four diskette modules.

The 4131 diskette storage cabinet has two full suspension roll-out units with a 400-diskette capacity.

Both the diskette transporter and the diskette cabinet come with a roll-up tambour door with lock.

The storage module costs $22; the transporter costs $127.50 and the diskette storage cabinet costs $167.50 from the firm at P.O. Box 4081, 12550.

Datapro Survey Finds

DEC Users Happiest With Mainframes

DELRAN, N.J. – Users of Digital Equipment Corp. large-scale computers expressed a higher degree of overall satisfaction than users of any other make of general-purpose mainframes in a recent Datapro Research Corp. survey.

Burroughs Corp. won the software laurels by earning the highest user ratings for its operating systems and compilers.

Based upon a questionnaire mailed to 8,200 Datapro subscribers in June, the survey attracted 2,041 responses representing users' experience with a total of 2,381 general-purpose computers.

The survey respondents were asked to assign ratings of excellent, good, fair or poor to 12 distinct aspects of their computer equipment and the associated software and vendor support. Then, by assigning a weight of 4 to each user rating of excellent, 3 to good, 2 to fair and 1 to poor, Datapro calculated a "weighted average" rating for each category.

In the overall satisfaction category, the eight major computer manufacturers earned these weighted average user ratings: DEC, 3.4; Xerox, 3.3; IBM, 3.2; Burroughs and NCR, 3.1; Univac, 3.0; and Control Data Corp. and Honeywell 2.9.

The top-rated companies in each of the other rating categories were as follows: reliability of mainframes, Xerox; reliability of peripherals, IBM; responsiveness of maintenance service, DEC; effectiveness of maintenance service, DEC and IBM; and technical support, Xerox.

Burroughs led for operating systems and assemblers and compilers, Xerox for applications programs, DEC for ease of programming and ease of conversion and Burroughs for ease of operation.

The category that received the highest overall user ratings was reliability of mainframes, while technical support and applications programs were judged to be the weakest areas for nearly all of the vendors.

Ironically, Xerox, which was rated tops in all three of these categores by its users, announced its withdrawal from the general-purpose computer business shortly after the survey was conducted.

IBM products were rated slightly above the overall industry averages in four categories (reliability of peripherals, effectiveness of maintenance service, technical support and overall satisfaction) and essentially equaled the industry averages in all of the eight remaining categories.

IBM computers accounted for 1,448, or 71%, of the 2,041 user responses, while sample sizes for the other vendors ranged from 163 responses for Honeywell to 25 responses for both DEC and Xerox.

The Datapro report, "User Ratings of General-Purpose Computer Systems," contains the individual ratings earned in each category by some 60 computer systems. Additional tables analyze the responding users' methods of acquisition, principal applications, sources of applications programs, usage of remote terminals, and usage of "foreign" (plug-compatible) peripheral equipment.

The complete survey results are available in an eight-page report priced at $10, Datapro said from 1805 Underwood Blvd., 08075.

Inforex's Smallest Key-to Disk Serves Up to Four Keystations

BURLINGTON, Mass. – Inforex, Inc. has introduced its smallest key-to-disk system – with a maximum of four keystations – aimed at replacing clusters of keypunches or stand-alone data entry devices.

Called the Model 1300, the system is nonprogrammable, but the user can format records, print from either disk or tape, capture totals and do some limited editing, an Inforex spokesman said.

The Model 1300 offers both binary synchronous communications and Inforex's Infosync synchronous communications feature which permits communications between the 1300 and other Inforex key-to-disk systems.

Data transfer can take place from either tape or disk, and communications can be controlled from either a keystation or a remote terminal.

Communications and data entry/verification can go on concurrently, as can printing and key entry.

The processing capabilities of the system are said to be similar to those in Inforex's other Series 1300 data entry systems and include reformatting, cascading program levels, self-balancing, left-zero insertion, right boundary checking, in-context editing and automatic field correction.

A typical four-station Model 1300 consists of a control unit, a 5,000 record disk drive, an 800 bit/in. tape drive and four CRT stations.

Both serial and line printers are available for the system. Printer speeds range from 30 char./sec to 400 line/min. Card reader speed is 300 card/min.

The system is available for purchase and on three- or five-year leases. A typical four-station system costs $683/mo, including maintenance.

Delivery is 60 days from the firm at 21 North Ave., 01803.

Net Responds 10 Times Faster After 370 Gets Memory Boost

SAN FRANCISCO – The installation of semiconductor add-on memory on an IBM 370/158 here has brought a tenfold improvement in the average response time of a large CRT terminal network.

The 158 is one of two such machines in a major government DP center. The 158 with the add-on semiconductor memory handles two on-line, real-time communications networks which provide on-line inquiry and update capabilities to 14 criminal justice users and a 500-bed teaching hospital.

The 158 runs under VS/2. During peak periods, the paging rate previously ran between 40- and 60 page/sec, which produced a 45- to 70 sec response time on the terminals, according to Thomas Johnson, the center's assistant director.

The center decided the 158 had the "horsepower" necessary to handle transactions once the data was brought into real memory, Johnson explained. So the center started looking for additional memory for the 1M-byte system.

IBM came to mind as a source, but the mainframer would not lease add-on memory for the center's 158 because it was a purchased machine, Johnson said.

The center then sent out a 33-page questionnaire to five vendors and, "based on their responses to service, hardware capabilities and cost questions, we selected Intel's In-7158," Johnson said.

The major reasons for the choice were "the financial stability and overall know-how of Intel and the fact that it services its own equipment."

Installed on the real-time system in eight hours on a Saturday in July, the additional 512K reduced average terminal response time from 37.5 sec to 3.5 sec, Johnson said.

So far reliability has been "very good," he said. The add-on memory leases with maintenance for $2,350/mo.

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RAYTHEON

To Get Money's Worth

Users Must Realize Potential of DP-Aided Data Entry

By Kim Kahn
Special to Computerworld

Many users who have gone from keypunch input to key-to-tape, key-to-disk and on-line data entry systems have managed to save money, but are not getting the most out of their new machines.

The problem is they still consider these systems as data entry systems, not data preparation systems that can be an integrated part of a user's total DP capability.

Too many companies still regard their key-entry department as a clerical group that puts data into the computer for control clerks to balance or correct at a later time.

The main computer still runs the same long edit and balance routines left over from key-punch days. The 80-column card image is still the basic input record.

Although key-to-disk units are driven by a computer, the tendency is still to consider key entry as only that – key entry. Thus, an important fact is overlooked, i.e., that these systems are in fact computer systems, on-line time-sharing systems to be more precise, dedicated to the purpose of generating accurate and useful data.

A Matter of Training

Optimizing any new technique is a matter of training. When a company purchases new mainframes, all operations and key software people are immediately trained on the new system. On the other hand, the arrival of sophisticated key-entry equipment normally brings training only for people actually involved with key-entry. Even for these people, the training on key-to-disk equipment is primarily focused on actual entry and not on systems training. This segregates data entry and mainframe tasks.

Efficient data preparation dictates the proper balance of all data processing tasks. This balance can be accomplished by cross-training in the key cost areas of data processing (entry, operations, edit/control) and, most important, education of development personnel in the full processing capabilities of data preparation systems. Systems development personnel, for example, must be trained to think in terms of the total process of data preparation. They can then recognize the strengths and limitations of each element within their total DP system.

Once the firm starts to utilize the real processing potential of computer-assisted data entry systems, it can balance the tasks assigned to each part of its DP systems and so eliminate such redundant activities as repetitive edit and balance routines.

Key-to-disk data entry should be designed to solve data capture problems and to conform to the nature of the source document.

Key-to-disk systems today offer not only keypunch replacement benefits (eliminstion of cards, CRT prompting, batch control, simple editing snd totaling), but also editing snd validsting capabilities, along with dats control features.

The Entrex equipment 1 have used and other key-to-disk gear can provide editing in an interactive mode between the system and the operator, but also offer additional editing and validating in a background partition.

Some computer-assisted data entry systems can provide the full integration of all DP tasks with little or no long-range reprogramming or system redevelopment efforts. Specific key-to-disk features which fscilitate integration include the following:

- Processing power capable of all input/output, verificstion, editlng, valldation, control and reformatting functions.
- Background processing including the cspability to perform cslculations upon data, sort and merge operations, data communication and selective output of data (i.e., all standard computer functions).
- File management capability via standard software, providing file inquiry and data base mansgement functions.
- Standard communication software providing a range of options, protocols and bit/sec rstes.
- Stsndard software with Cobol-like langusge, providing the user with the ability to tailor the system to his requirements.
- Easy program generation through interactive program development and macro-type verbs in the programming language.
- Minimal mainframe reprogramming provided by comprehensive data reformatting routines which convert dats from source document format to mainframe format.

Kahn is president of Scientific Business Systems, Inc., Willow Grove, Pa.

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DATASHARE is a fully programmable, multi-user system using a powerful processor and a line of perlpherals to matcb your needs. Using the Datapoint 5500 processor with 48K user memory, 16 users can slmultaneously access the system and accomplish data entry, data processing, flle management or report generation. Programming can be qulckly accomplished in DATASHARE language. Each user can run a separate program and access single or multiple publlc or restricted files. There's no splnning wheels trying to make a limited system fit specialized needs – DATASHARE's lnherent flexiblllty and powerful software lets the user at each remote site readily accomplish the task at hand.

WITH VIRTUAL MEMORY
Optimum productivity from any computer system requires an Operating System that allows user programs to exceed the maln memory size. Most large mainframe systems today use virtual memory technlques, and so does DATASHARE. Up to 512 K characters (bytes) of space may be shared among the maxlmum 16 DATASHARE users sucb that each user is assured a 32K program space.

DYNAMIC FILE MANAGEMENT
Any business processing system worth its salt needs a file structure that users can work *with* easlly, not have to work *around* arduously. The flles generated on tbe DATASHARE system are totally dynamlc – which means that users can easily create new files without regard to file length or use of complex file tables. Also, flles can be combined, added to or deleted wlthout complex technlques or system conslderations. And DATASHARE files are compatible wlth other Datapoint programs such as DATAFORM, DATABUS, BASIC, RPG 2, etc. There's no need for tedious tlme consuming file conversion routlnes to use DATASHARE files ln other applications or wlth other non-DATASHARE Programs.

EASY FILE BACK-UP
Many competltlve systems are oblivious of the real business need for keeping duplicate files, offering only relatively primltlve capability for file duplication or back-up. DATASHARE's Operating System allows a convenlent means to duplicate entlre dlsk flles and utilitles for cassette-disk, tape-disk or dlsk-dlsk duplication procedures, allowlng crucial back-up files to be easlly made.

CONCURRENT COMMUNICATIONS/PROCESSING
Datapolnt processors have long been noted for their powerful communications packages, whereby program and data files can qulckly be transferred between processor sites. Slmllarly DATASHARE now offers the abllity to transmit and receive data flles while the field system users contlnue using DATASHARE for standard applications. Flles may now be sent to a central home office or other computer site wlthout any interruption to normal ongoing usage.

Likewise, as wlth any computer system, there's a need to create new programs, to debug, to run utllities or other batch operations. With DATASHARE's concurrent processing capabillty the system manager can do all these, can run RPG 2, BASIC or DOS Utilitles from the central processor console wbile the system's terminal users stlll enjoy full access. With this capabllity, new system development, or "odd jobs" don't have to wait for off-hours.

REMOTE OR LOCAL USER TERMINALS
DATASHARE user termlnals can be placed up to 2,000 feet away from a central 2200 or 5500 processor using slmple twisted pair connectlons. But if there's a need to go further, the terminals can be booked to modems or acoustic couplers and standard dial-up telephone lines using conventional hardware. In fact you can cross the country wlth a DATASHARE network. And you can bave one or more DATASHARE ports used as a dial-up facllity sequentially accessed by an unlimited number of fleld users. To make field office usage even slmpler, all DATASHARE hardware and software is operator-oriented wlth a minimum of controls. The 3600 user-terminal, for example, bas a straightforward typewriter style keyboard and easy to read non-glare dlsplay.

PROGRAM FLEXIBILITY
Thousands of DATASHARE Installations in field locations have demonstrated the flexibllity and cost effectlveness that a proven system can provlde. But there's another important advantage to DATASHARE usage – program interchange. Programs written for your DATASHARE can also be used ln the popular Diskette 1100 Intelligent Terminals. With this capability, programs need not be restricted only to DATASHARE sites but can be used for those applications whenever a single-user stand-alone system such as a Diskette 1100 ls utllized. Also, programs written for tbe Dlskette 1100 wlll run in the multi-user DATASHARE system.

ADAPTABILITY – DATASHARE'S MIDDLE NAME
Another nice thing about DATASHARE ls lts ready adaptablllity to your company's needs and requirements. In some organizations, it may serve as an lndependent computer utility, providing computer power for a multitude of applications to lts work stations. In others, the user terminals may serve strictly for data entry, editing and pre-processing of field data so that a large central computer can function most efficiently. For some users, the powerful lndependent processing at dlspersed work stations ls the attraction. For others, lt's tbe ability to structure very tightly a computerized approach for previously manually bandled chores. Or it can be a combination of all of the above. Adaptablllity – DATASHARE's mlddle name and another good reason why it's the best yet.

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Switch to Key-to-Disk Lowers Wage/Operator for Firm

By Beverly Ross
Special to Computerworld

When American Computer Tax, Inc. (ACT) switched from keypunch to key-to-disk data entry, it found it could hire less experienced and, thereby, less expensive help for its busy season.

ACT is a Lakewood, Colo., firm that processes tax returns and accounting data for professional accounting firms and attorneys in seven states.

Since it is impossible to find any two tax returns where all items are repeated, the data entry system and the editing process must be highly refined.

When ACT replaced keypunch machines with a key-to-disk data entry system, it hoped to:

- Double. productivity/operator.
- Utilize inexperienced and untrained data entry operators.
- Reduce entry error rate.
- Reduce data entry costs through elimination of the need for numeric verification.

All of the above has been accomplished since the Octoher 1974 installation of a Univac 1900 key-to-disk system.

50,000 Returns Processed

ACT processed 40,000 to 50,000 tax returns annually with the major portion processed from Jan. 1 through April 15. The throughput capabilities of the 1900 system are such a significant improvement over keypunches that we now require half the number of machines and operators previously required.

Furthermore, the average wage per operator is less than we would have to pay keypunch operators. This is due to the self-training capabilities of this data entry system and its capability to edit input, thereby eliminating operator decisions.

ACT hires as many as 30 additional operators during the peak season.

New operators get used to the system with a hands-on training program supplied by Univac, and this training program is then supplemented by programmed instruction and testing on ACT's own input formats.

Upon completion of a training program, the length of which is two to 10 days depending on machine background and experience of the trainee, the operator is able to key live data.

Machine Detects Errors

The machine itself is programmed to detect all kinds of errors. When it detects one, it will not allow the operator to continue until the error has been properly handled.

Our clients must be confident that the service provided them is accurate in output and has been processed from error-free input. We must also ensure rapid turnaround time.

The 1900 system helps ensure that if the input information is incomplete and/or incorrect, the data entry operator is alerted by the system prior to entry. The error can then be referred to the preparer and corrected prior to actual processing. Key entry error is also eliminated in the same manner.

Less Time, Money

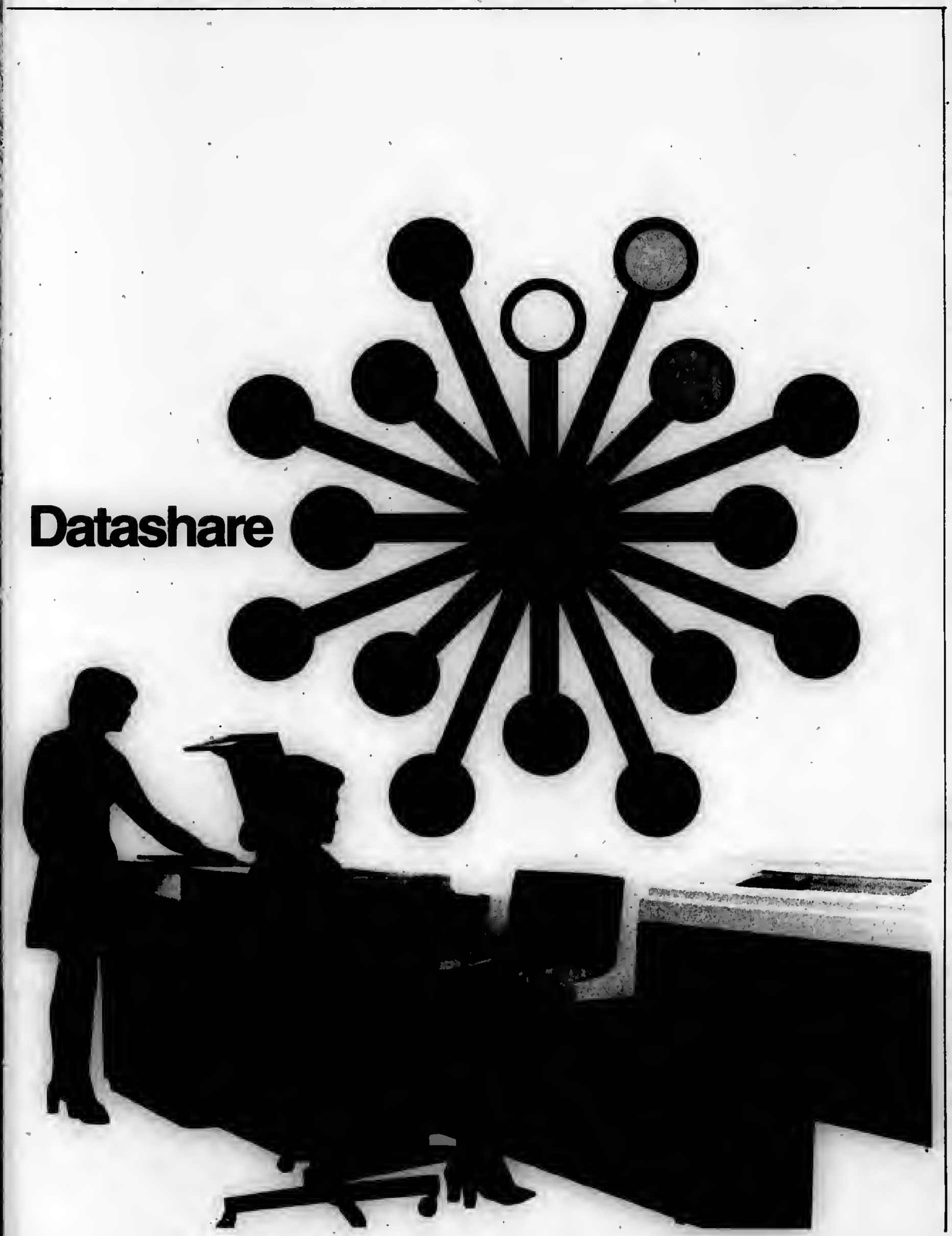
All of the above results in less time and money going to mainframe edits and processing and helps ACT provide its clients with less expense, faster service and the confidence that the material is as accurate as possible.

Studies by our company have revealed that detection of errors at the time of entry has eliminated 98% of the error rate (including user-created errors) experienced in the past when using keypunch machines. The only errors left for the mainframe to check are those detected by "reasonability" limitations and caused by inaccurate input.

The 1900 hardware costs more than keypunches. However, comparison of wage costs between the key-to-disk system and a keypunch system reveals the time-saving advantages of the key-to-disk system over the keypunch system makes up by far for the extra hardware costs.

Cost comparisons between our keypunch and new key-to-disk system have revealed that overall data entry costs for one Jan. 1 to April 15 peak period are a third lower.

Ross is vice-president of American Computer Tax, Inc.



Bulk Tape Eraser Works in 5 Sec

WALTHAM, Mass. – The Kybe-Weircliffe Model 8 bulk tape eraser can completely erase a 14-in. magnetic tape reel in 5 sec, according to Kybe Corp., which is marketing the device.

The bulk tape eraser, designed by Weircliffe of Exeter, England, has no moving parts, Kybe said.

The user simply presses a button on top of the eraser's cabinet, inserts the tape as the cabinet's door opens and removes the tape seconds later when a light signals the tape has been erased, Kybe explained.

Another Kybe-Weircliffe tape eraser, the Model 30, is designed to erase Philips-type cassettes.

The Model 8 costs $995 and the Model 30 $125 from Kybe at 132 Calyary St., 02154.

Ansi OKs Standard To Put Uniform Data On Microfilm Labels

SILVER SPRING, Md. – The American National Standards Institute (Ansi) has acccpted the National Microfilm Association's (NMA) industry standard for microfilm package labeling.

Ansi made one major change before accepting the standard. What were once suggested storage conditions and film winding instructions are now a required part of the label information.

The purpose of the standard is to ensure uniform information is clearly placed on all labels for the packaging of photographic materials, including microfilm in roll, sheet and card formats.

The standard, PH5.19-1975, is available from NMA, Publication Sales, 8728 Colesville Road, 20910 at $1.50 to NMA members and $2 to nonmembers.

COM Course Offered

SILVER SPRING, Md. – The Computer Image Processing Division of the National Microfilm Association (NMA) has chosen the meeting sites and dates for six educational seminars beginning in January and continuing, one a month, through June.

The course will stress the value of computer-output microfilm (COM) as an integral part of various information systems, NMA said.

The seminars will be held Jan. 13-14 at Stouffers National Center Inn in Washington, D.C.; Feb. 17-18 at the Hilton-Airport in San Francisco; March 22-23 at the O'Hare Hyatt in Chicago; April 7-8 at Barbizon Plaza in New York City; May 25-26 at Peachtree Center Plaza in Atlanta and June 29-30 at the Le Baron in Dallas.

The two-day seminars cost $100 from the NMA at 8728 Colesville Road, 20910.

Two IBM Instrument Systems Combine Spectrophotometry, DP

HARRISON, N.Y. – IBM has introduced two integrated instrument systems which combine spectrophotometry with digital computer processing and output their data onto floppy disks.

Called the IBM 7840 Film Thickness Analyzer and the IBM 7841 Textile Color Analyzer, the systems are intended for use in the semiconductor and textile industries.

The Film Thickness Analyzer may be used to measure specific semiconductor film thicknesses ranging from 300- to 55,000 angstroms, IBM said.

The Textile Color Analyzer can be used in a variety of applications ranging from color matching and calculating dyestuff quantities added during production to determining color values and shade sorting.

Selected measurement results can be displayed immediately, printed and stored for future recall. In addition, specific data may be transferred through the diskette to a computer for further analysis or entry into a product historical data base, IBM said.

First customer shipments of the systems are scheduled for January. The 7840 costs $85,000 and the 7841 is priced at $80,000 from the firm's Systems Products Division, Integrated Instrument Systems, 600 Mamaroneck Ave., 10528.

Air Conditioner Has Precision Readout

COLUMBUS, Ohio – The Deluxe System/2 air-conditioning units from Liebert Corp. have a Precision Control Readout (PCR-2) designed to give computer operators data on the operation of the System/2 and on environmental conditions in the computer room, as well as control over the system.

The standard panel is composed of a start button, which also serves as a push-to-test system for the malfunction indicator lights. It is also used as a manual reset button.

A red stop button shuts off the system and also indicates temporary loss of power or low voltage. A white silencer button quiets the alarm when a malfunction occurs. The indicator lights stay on until the indicated problem is remedied.

And the PCR-2 display panel indicates cooling, reheat, humidification, dehumidification and dirty or clogged filters.

It also registers high head pressure in the compressors, loss of air flow, high or low room temperature and high or low room humidity when the optional Mode-Alert is specified.

There is an area on the panel for special alarm systems a customer may require.

Liebert is at 1050 Dearborn Drive, P.O. Box 29186, 43229.



Get Any Vibes?

What are these men doing? The one with the hammer is tapping the phase leads that conduct power out of a Westinghouse 870M volt ampere generator. The other man is watching a frequency analysis of the vibrations on a Hewlett-Packard Fast Fourier analyzer.

If the natural frequencies of the phase leads turn out to be too similar to the frequencies produced in power generation, "sympathetic vibrations" could shorten the life of the phase leads.

Westinghouse said thorough harmonic testing of generator elements now takes one day compared with five days for conventional methods.

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Four Firms' Systems Debut

Products Coming Fast and Furious From Many Sources

Minicomputer announcements have been coming fast and furious during the past few weeks, both from the traditional minicomputer makers and other disparate sources.

Last week there were four such announcements: A slight reconfiguration from the industry leader, Digital Equipment Corp.; a line of systems from component maker Texas Instruments (TI); and the announcement of mini systems by two terminal firms – Tektronix, Inc. and Anderson Jacobson, Inc.

TI Line Mixes Micros, Minis

TI jumped back into the minicomputer business with a compatible line that mixes microprocessors and full mini systems.

The family of digital processors includes the TMS 9900 microprocessor, the Model 990/4 microcomputer and the Model 990/10 minicomputer. Also included are software development systems, cross support on time-sharing networks and a prototyping system.

The TMS 9900 is a one-chip, 16-bit microprocessor using MOS N-channel silicon-gate technology.

The 990/4, a complete microcomputer on a single printed circuit board, uses the TMS 9900 as its central processor and the general-purpose 990/10 minicomputer is a TTL implementation of the 990 architecture to provide higher performance speeds.

The 990/4 and 990/10 computers are available in several chassis configurations: an OEM package, a 7 in. (6-slot) or 12-1/4 in. (13-slot) rack-mountable chassis or a tabletop enclosure. A programmer's front panel console is available for both chassis.

Cross support is available for users to develop applications programs for the 990/9900 family. It consists of assembler, linking loader and simulator on National CSS, Tymshare and GE time-sharing networks.

Software Systems

In addition, two stand-alone software development systems were announced. One consists of a 990/4 microcomputer with 16K bytes of memory, a software development package and a TI Silent 700 ASR data terminal.

The second stand-alone system is disk-based and includes a 990/10 minicomputer with 64K bytes of memory, up to four 2.2M-byte disks, a TI Silent 700 ASR terminal, a TI Model 913 video display terminal, a DX10 software development package and optional line printers and card readers.

A prototyping system to permit TMS 9900 microprocessor users to develop custom software and firmware modules is also available. This system consists of a 990/4 microcomputer with 16K bytes of memory, a Silent 700 ASR terminal and an optional programmable read-only memory (Prom) programming kit.

Since all models in the computer line use the instruction set of the TMS 9900 microprocessor, software developed for the low-end computers will be compatible with the higher performance models, TI said.

Bit, byte and word addressing of memory and I/O interfaces is standard in each 990 model. This facilitates data collection and transfer to remote locations and is an advantage to OEMs and end users who have distributed data bases, data communications networks or manufacturing automation environments, according to TI.

An asynchronous 16-bit parallel I/O data bus (Tiline), links the CPU, memory and peripheral devices.

Because the bus is asynchronous, it can support high-speed memory as well as slower memory, minimizing sychronization problems found with synchronous DMA channels.

Other features include a 120-Hz. real-time clock input, vectored interrupts and hardware multiply and divide.

The 990/4 has memory expansion to 58K bytes, and the 990/10 has memory mapping feature that provides memory protection and privileged instructions and supports memory expansion to 1M bytes, both of which are available options.

The 990 computer family is supported by a library of software development packages, including disk and nondisk operating systems, utilities and Basic, Cobol and Fortran compilers.

The 990/4 microcomputer is priced at $368 with 512 bytes of memory and at $512 with 8K bytes of memory. The 990/4 microcomputer with a 6-slot chassis, power supply, programmer's panel and 8K bytes of memory is priced at $1,216.

Add-on memory for both computers is available up to 40K bytes on a single printed circuit board in 8K-byte increments. The price for a 40K-byte memory board is $1,600.

The 990/10 minicomputer, with 16K bytes of memory, chassis, power supply and programmer's panel, is $1,968. Deliveries of the microprocessor, the computers, the software development systems and the prototyping systems are scheduled to begin in the first quarter, the firm said from P.O. Box 1444, M/S 784, Houston, 77001.

DEC 'Super' System

A parallel processor version of the PDP-8/A that performs fixed- and floating-point computations has been announced by Digital Equipment Corp.

Called the "Super-8," the minicomputer incorporates a second processor to perform all fixed- and floating-point arithmetic operations in hardware. The Super-8 continues to use the conventional PDP-8/A processor for other functions, such as input/output operations and system management.

The Super-8 was designed for OEMs and end users who need fast Fortran IV, floating point and extended-precision arithmetic at reasonable cost, the firm said.

Sample instruction times include 10.5 μsec fixed-point add, 30 μsec floating-point add and 37.5 μsec floating-point multiply, DEC added. It is completely compatible with previous models of the PDP-8 family.

Priced from $5,995 including 8K words of core, the Super-8 is scheduled for delivery in early April.

The Super-8 operates with three data formats: 24-bit fixed point, 24-bit floating point with 12-bit exponent (36 bits) and 60-bit floating point with 12-bit exponent (72 bits) for extended precision arithmetic.

It can run Ansi-compatible Fortran IV under DEC's OS/8 operating system and present PDP-8As can be field-upgraded. Other features of the Super-8 include eight index registers and 64 new instructions. The floating-point processor uses a 15-bit address path, directly addressing 32K words of memory.

Tektronix 'Personal Computer'

The Tektronix 4051 is a "personal computer" that compares with IBM's 5100 in price and performance, but offers an interactive graphics capability besides, a spokesman said.

Both machines have keyboards, displays, function keys, numeric pads and a 3M Co. tape cartridge for mass storage. The Tektronix 4051 offers extended Basic, while the IBM machine supports both Basic and APL.

The 4051 offers a maximum 32K compared with the 64K available on the 5100. Both devices offer asynchronous communications.

The 4051's much larger display (2,250 characters vs. the 5100's 1,024 characters) signifies the major differences between the two machines.

The 4051, Tektronix said, has the graphics capability to produce "very natural pictures, civil engineering maps, financial data and other data" on its display screen.

It is somewhat difficult to place the 4051 among the current types of DP hardware.

With its Motorola 6800 microprocessor, the 4051 can run a Basic program in about the same time as a Digital Equipment Corp. PDP-11/05 can.

It has an output- only RS-232 interface to drive printers, but offers an optional RS-232C I/O interface that can provide on-line, interactive terminal communications at 2,400 bit/sec with a remote mainframe.

Graphics Capability

And then there is the graphics capability, a spokesman said.

The 4051 could serve as a programmable calculator, but it also offers graphics, communications and an IEEE standard general-purpose interface bus that can link it with most testing and measuring equipment now on the market, the spokesman said.

And the 4051 is an alternative for the terminal user because it can serve as both an intelligent terminal and a Basic language and graphics processor, he added. Additionally, the 4051 can appear as any other Tektronix terminal to in-house or commercial time-sharing software, the spokesman said.

Like IBM's 5100, the Tektronix unit offers software packages that emphasize its use as a problem-solving tool. General-purpose graphics, statistics, mathematics and electrical engineering packages are currently available.

Tektronix offers free tutorial software for the new user, plus verification software to make sure the system is functioning correctly.

An 8K 4051 sells for $6,995 or leases at $280/mo on a 36-month lease.

Tektronix is at P.O. Box 500, Beaverton, Ore. 97005.

AJ 140 Has Accounting System

Anderson Jacobson, Inc. (AJ), known in the data communications industry for its acoustic couplers, printer terminals and peripheral equipment, has announced the Model 140 minicomputer system.

The standard system provides 16K bytes of core memory, three cassette drives and a console keyboard/printer.

The system is expandable to include up to 64K bytes of memory, four disk drives (storing 40M data characters), 200 to 600 line/min printers and multiple input stations, either CRTs or keyboard printers.

Communication controllers are available for the Model 140, and the system will accommodate up to eight remote terminals, CRTs or other devices.

Anderson Jacobson will furnish, without charge, all standard software required for general ledger accounting applications (accounts receivable, accounts payable and payroll), the firm said.

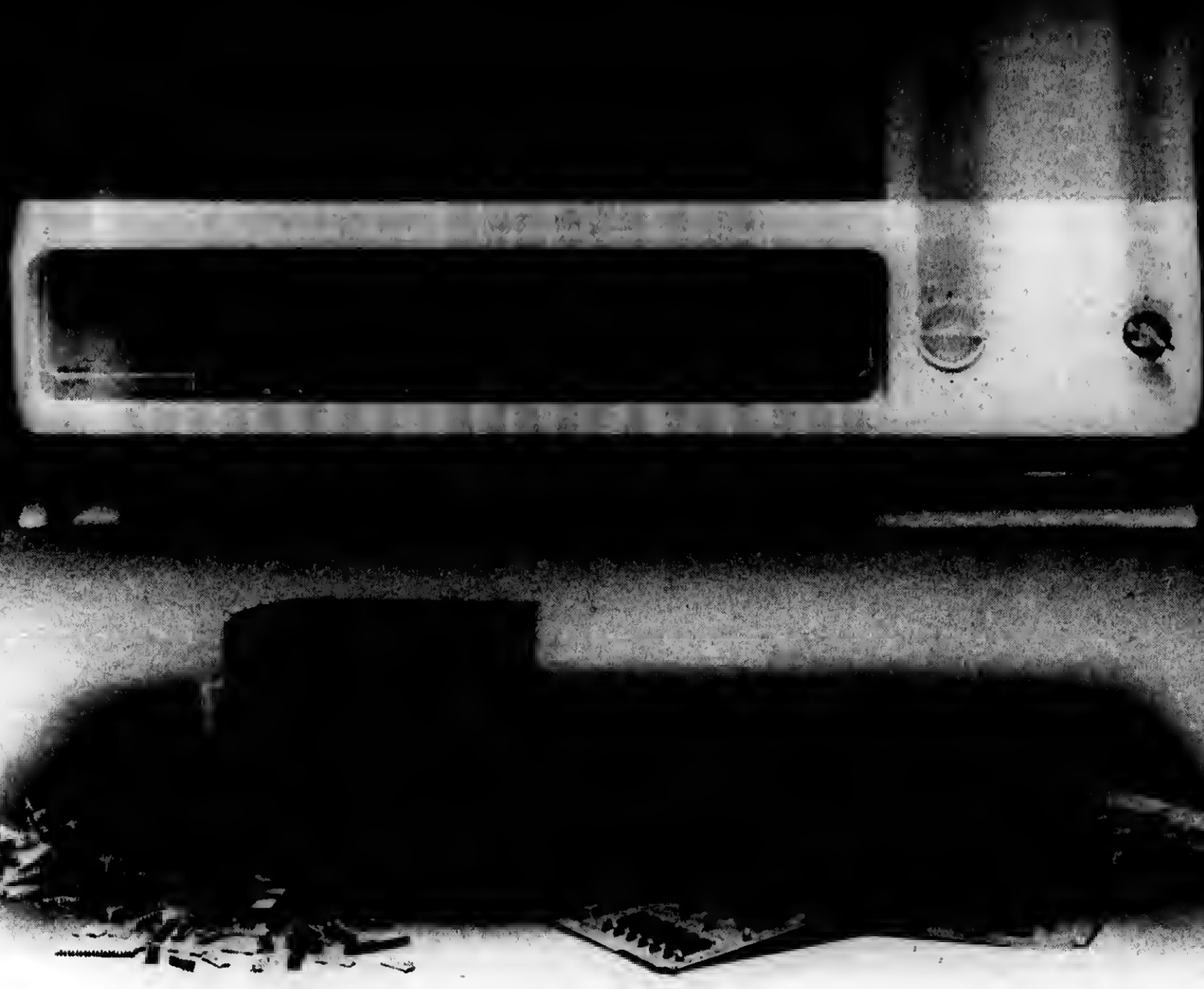
The basic system leases for less than $500/mo or $22,500 from the firm at 1065 Morse Ave., Sunnyvale, Calif.

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Data General Europe, 15 Rue Le Sueur, Paris 75116, France. Data General Australia, Melbourne (03) 82-1361/Sydney (02) 908-1366.

Spy Film Features DEC Mini System In Supporting Role

MAYNARD, Mass. – A minicomputer system developed by Digital Equipment Corp. is featured prominently in Dino de Laurentis' spy film thriller, "Three Days of the Condor," a Paramount Pictures release.

The system, which is built around a PDP-8/E computer, is shown in the role of a device to scan books printed in foreign languages and provide English translations.

According to the script, the book-reading minicomputer system is employed by the Central Intelligence Agency to help a research team check novels and anthologies of detective stories and espionage to see whether their authors have invented new and unusual "tricks of the trade."

"Three Days of the Condor" stars Robert Redford, Faye Dunaway, Cliff Robertson, Max Von Sydow and John Houseman. Directed by Sydney Pollack and produced by Stanley Schneider, the film concerns a researcher (Redford) who stumbles upon a secret that means the immediate death of his coworkers. By chance, he escapes being killed and must go into hiding to survive.

During his three-day run from danger, he finds the CIA is deeply infiltrated with foreign agents and is forced to track them down by himself, instead of relying upon the agency for help.

The plot gets its love interest when he kidnaps a passing – and naturally beautiful – motorist who ends up, again naturally, falling in love with him and helping with the search for the enemy agents.

With the exception of the device to "read" the books, all hardware for the computer system is standard. The output device is DEC's dot-matrix Decwriter I, the miniature tapes employed for storage of data and programs are Dectapes and the large fast-access storage device is a Decdisk pack.

Peripheral Purchase Plan Said to Cut S/3 Cost 50%

IRVINE, Calif. – Business Systems Technology, Inc. (BST) has added a Peripheral Purchase Plan for its line of plug-compatible core memories, disk drives and line printers for the IBM System 3.

Included in the plan are reduced purchase prices on BST equipment which are said to result in overall savings of up to 50% on the System/3 – from $25,000 to $50,000 off the normal IBM purchase price – and an expanded rental credit policy for BST customers allowing up to 36 months and 40% off base price.

A typical Model 10 user with 24K of memory, two disk drives, a line printer and MFCU will save $36,000 overall buying his peripherals from BST, a BST spokesman said.

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A simple case underlines the point. A major telephone company installed a Bell & Howell Intelligent Mark Reader terminal to process trouble reports and dispatch repair crews. As information is received on the phone, a tab-card trouble report is marked by pencil, placed in the IMR terminal, and automatically checked for errors. The information is then reformatted and transmitted to a central computer where the data is routed to the appropriate service center. The IMR terminal takes 3 hours to provide 100% error-free data entry. The same job originally required 40 hours manual keying, with an unknown error factor. The per-installation salary savings are about $1000 a month. Valuable connect-time requirements dropped from 15 hours monthly to one hour – a savings of around $170 a month per installation. Think of these savings for every one of 28 installations!

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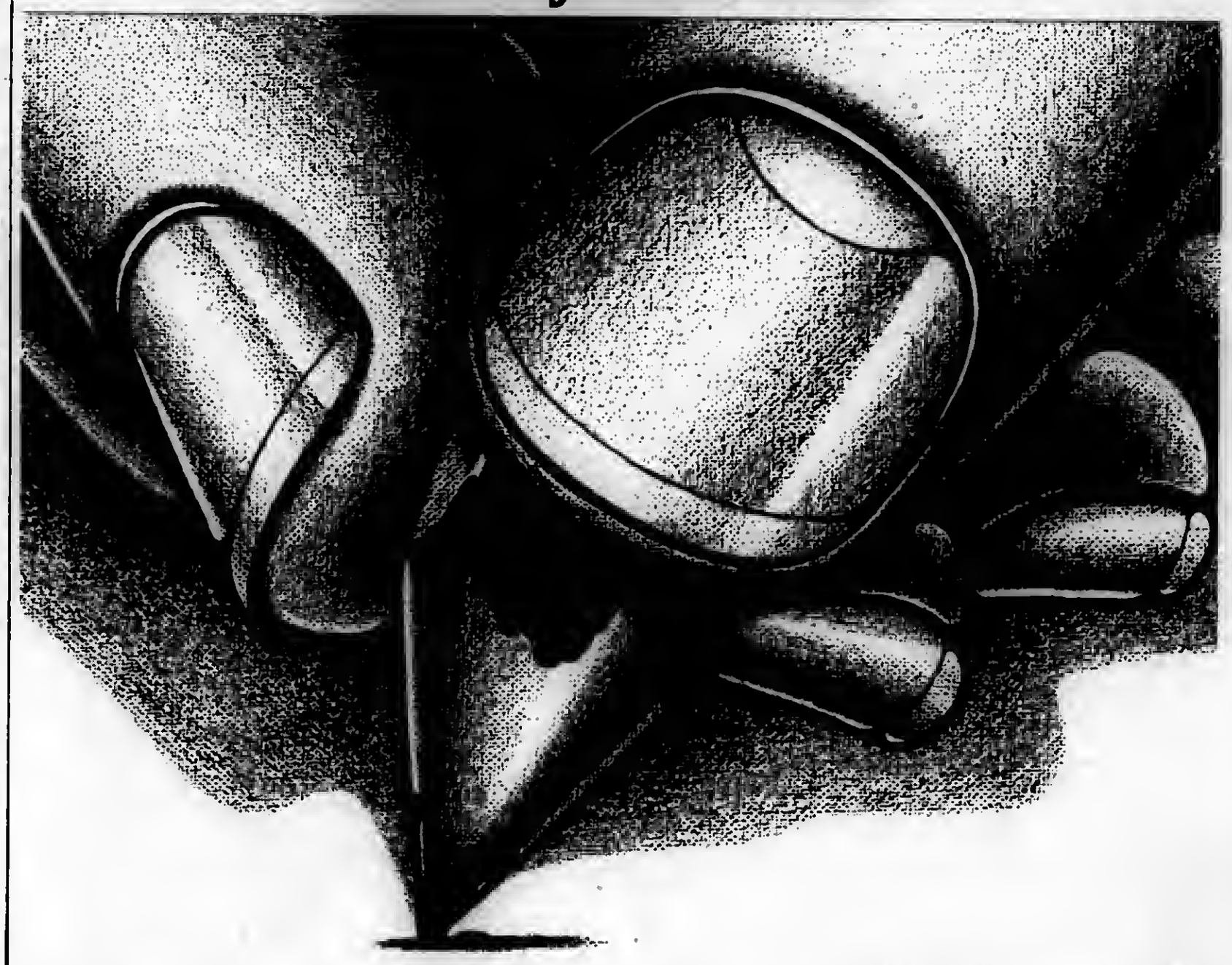
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IBM Scores Another Technological Point With 5100

By Ren Nardoni
Special to Computerworld

The new IBM 5100 portable computer is an amazing piece of equipment (so said IBM, and this user agrees). However, don't run out and put your order in until you have finished this whole review.

I was fortunate enough to have had a demonstration of the 5100 the other day. As one might be able to tell from the specifications, the 5100 is slightly larger than the average portable terminal. In fact, the salesman brought it with him on the subway, put it on my desk, plugged it in (normal circuits), turned it on and the machine was ready to go.

The 5100 comes with either Basic or APL (or both) with a switch on the front panel for selecting the language you wish to use. Being more familiar with Basic, I concentrated on the machine's handling of that language.

The keyboard comes with a command key which, when depressed, converts the alpha keys to Basic verbs. Therefore, to input the verb "Print," the user just depresses the "CMD" key and hits the letter "L" and the word "PRINT" is loaded into the machine. The word "PRINT" is printed on the front of the "L" key.

All the main Basic verbs are represented in this manner, and this user found programming in Basic extremely fast. Additionally, the numeric keys are converted to system commands when used in conjunction with the "CMD" key.

The display screen seemed small, yet when in use the size appeared to be adequate for most functions I was performing. There is a switch on the panel to reverse the screen from white-on-black to black-on-white. The 5100 can also be attached to television monitors for training and presentations. The right-hand bottom corner of the screen indicates usable storage so that the user knows how much is still available.

For flexibility in reviewing program code, the scrolling feature that rolls the display up and down operates very quickly. Format errors in Basic cause the screen to flash, and an error message and indicator tell the user where the error occurred.

Analysis

Each Basic line is interpreted at input for instant verification. When executing, the results seemed to appear instantaneously. The machine is fast.

IBM also offers canned software routines (on tape) for mathematical, statistical and business applications. Although the basic 5100 comes with 16K, I don't think you could effectively use these canned routines in less than 32K. Up to 64K is available. The routines cover almost all of the normal functions I would use in financial analysis. The tape unit is fast, but is obviously restricted in speed due to sequential handling. One cannot update part of a file or program without rewriting the entire file to the tape. This would be a restriction to me when updating some medium to large data files.

All of the IBM literature on the 5100 emphasized a machine for "problem solvers," and I agree that for some applications the 5100 would be exciting.

For users requiring large amounts of data manipulation, the stand-alone machine would have obvious drawbacks. However, the user with repetitive functions or with functions independent of outside data bases and software could possibly use the 5100 to replace some commercial time-sharing applications.

Also, the telecommunications option with the 5100 would enable a user to do both data analysis and repetitive functions. Using the 5100 as a terminal to extract data from external data bases onto the tape, the user could then revert the 5100 to a stand-alone machine to do analysis and/or report generating.

The 5100 is available by purchase only, and the price can range from approximately $9,000 to $27,000, depending on options. Considering normal depreciation rates, a potential purchaser may realize additional savings. The price tag seems reasonable, considering IBM equaled the 5100's power to that of the 360/30.

This user's opinion as to the impact of the 5100 on the time-sharing industry is that the industry will know IBM is there. The industry may lose some of the big number crunchers and calculator-type users.

However, some positive benefit may be felt by commercial time-sharing companies from the user who runs the IBM 5100 as both a terminal and as a stand-alone computer and who requires on-line data base support.

The 5100 has options I did not see or use (the impact printer and telecommunications options, for example).

More importantly, my views on potential uses and impacts on the time-sharing industry were based on the functions I perform at AT&T. Each user would need to look at his own operation to see the applicability and benefits of the 5100.

However, from a technology and state-of-the-art viewpoint, IBM has scored another impressive point.

This evaluation is reprinted, with thanks, from the Atsu Forum, *published by the Association of Time-Sharing Users, 210 Fifth Ave., N.Y., N.Y. 10010. Nardoni is supervisor of the financial analysis group at AT&T.*

Shugart Adds Floppy System Kit

SUNNYVALE, Calif. – Shugart Associates has introduced a kit approach for OEMs who want to include floppy disk storage in minicomputer or microprocessor systems.

The SA 8800 Streaker kit consists of a single 12.5 in. by 17.5 in. disk controller and from one to three diskette drives in optional single or double density depending on storage requirements.

The Streaker kit is for OEMs who wish to include their own "value-added" features. They can, at their option, add their own cabinet, standard power supply and interface.

Or, if they wish, they can purchase a standard Shugart SA 3800 diskette storage subsystem and add additional drives in increments of one, two or three in a single cabinet. The 3800 contains from one to three double- or single-density drives, the controller board and power supply in one package.

The Streaker controller board handles up to six drives in the IBM 3740 format (3.2M bit/drive) or in the double-density format (6.4M bit/drive).

The Streaker diskette drives are Shugart's standard SA800 model. OEM prices for the SA8800 in quantities of 50 with one drive in single density begin at $1,110. For double-density option, add $180, the firm said from 435 Indio Way, 94086.

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Key Mainframers Describe IBM Impact on Industry

• Norris: CDC Switched Emphasis to Services

By Naney French
And Edith Holmes
Of the CW Staff

NEW YORK – Honeywell Information Systems (HIS) prices are based on IBM's pricing lead rather than those of nonsystems manufacturers or other mainframe makers, Clarence W. Spangle said in court here recently.

Testifying at the government antitrust trial against IBM, Spangle, HIS president and executive vice-president of Honeywell, Inc., described "the other computer company's" history of pricing starting with IBM's decision to unbundle.

In 1969, when IBM announced its decision to price hardware, software, training, programming support and other services separately, HIS conducted a study of the effect this decision would have on IBM and on its competitors, Spangle said.

Unbundles With Series 60

Based on that study, HIS opted to continue to offer a system for a single price and actually did not unbundle until it introduced its Series 60 in 1974.

The company was concerned customers who had contracted for a system that included such services would be shortchanged, he said.

Although management realized HIS would have to unbundle eventually, "we expected customers to resist the end of bundled services," and "we hoped to gain some market advantage before making the pricing change," he explained.

Even though IBM offered its customers a reduction in monthly rentals of about 3%, that could only be viewed as a price increase because of the cost of software, he said.

Follows IBM Pattern

When it introduced the Series 60, Honeywell felt unbundling was the best way for it to handle supplies and services because its basic pricing policy was to follow that of IBM.

The firm also believed customers who really wanted services such as training and programming support would be willing to pay for them, Spangle said..

However, maintenance prices were not separated from the overall rental prices on HIS equipment, he said. Overall, HIS prices in the area of maintenance are somewhat higher than IBM's for purchased equipment because IBM has a greater density of installations that allows for economies of scale.

The long-run disadvantages of bundled prices, Spangle said, was the cost of providing users inflation-proof prices and the tendency to let technological improvements in hardware and software fall by the wayside.

IBM decided to unbundle because it felt its large eustomers wanted to provide their own services and because of pressure from leasing companies as well as software and peripherals companies, Spangle said.

Bundled prices were a central aspect of the Justice Department's complaint against IBM, he said.

HIS saw unbundling as a means for IBM to increase its revenues and become a more effective competitor in the service industries, Spangle said. HIS also believed IBM would lose some of its market share as a result of separating prices, he said.

Competition From Independents

Counsel for IBM dwelt primarily on Honeywell's pricing of the Series 60 in an attempt to show that price reductions on peripherals for Series 60 mainframes werc a result of competition from independent peripherals manufacturers rather than of competition from IBM.

IBM attorneys used HIS planning documcnts for peripherals pricing strategy that showed Honeywell considered tape drive makers, minicomputer manufacturers and the like in its pricing decision.

But Spangle said over and over again this was not the case.

In his discussion of industry standards, Spangle noted those for high-level languages and for formatting information on various kinds of input media were generally set by the American National Standards Institute.

However, he said there are also de facto standards set by the use of IBM equipment. In particular, these concern the transferability of data and information.

• Spangle: IBM Pricing Guides Competitors

By Edith Holmes
Of the CW Staff

NEW YORK – If you can't fight 'em and you don't want to join 'em, make some other aspect of the industry the major thrust of your business.

Control Data Corp. did just that when it decided to emphasize data services, William C. Norris told the U.S. District Court here in the government's antitrust suit against IBM.

Having been "clobbered" by IBM on two occasions – once when CDC introduced its 1604 and again with the advent of its 6600, Norris, the chairman of CDC's board and its ehief executive officer, said he couldn't stand by and permit that to happen to his company a third time.

Today, CDC's business is roughly divided into thirds: one-third data services, one-third systems manufacturing and the last third peripherals manufacturing. However, "wc consider computer manufacture and marketing an enterprise supporting data services," hc explained.

The reasons for this shift from systems manufacturing to data services were competition from IBM, Norris said. In the case of the 1604, CDC was not as successful as it had hoped to be, and the company had to terminate its program sooner than it would have liked.

While hc added there was also some competition from Univac and Philco, Norris said IBM's 7040 and 7044 were the 1604's chief competitors. It was between nine and 11 months before CDC obtained an order for a 1604 after IBM's introduction of these machines, he said.

Norris recalled similar compctition between CDC's 6600 and IBM's 360 line. That competitive situation forced CDC to lower the price of its 6600 and to announce the introduction of a more powerful machine – the 6800.

The effect of these two competitive clashes was not only a lawsuit brought by CDC on antitrust grounds against IBM, but also a change in the nature of CDC's approach to the marketplace, Norris said.

After eliciting testimony from Norris concerning the company's most profitable products and learning that thc 6600 had indeed been the most profitable –

(Continued on Page 36)

Oelman: NCR Lost Money Until '74

By a CW Staff Writer

NEW YORK – Testifying as a witness for the government in its antitrust case against IBM here, a former chairman of NCR startled government attorneys when he described the computer industry as "very dynamic" with "new competitors entering the field across the board every day."

While NCR's Robert S. Oelman did say there were many competitors, he did not comment on how profitable they were. Only since 1973 or 1974 did NCR begin to operate at a profit, he said.

Oelman, who retired in 1974, described the computer marketplace as "lease-oriented" and said NCR had put $700 million into this approach.

Ninety-five percent of NCR's equipment is installed on lease, he said, largely because a manutacturer that wants to stay competitive has little choice other than to offer leases.

NCR's share of the market now is 7% to 8%, Oelman said, based on figures from International Data Corp.

IBM, in contrast, holds 60% to 70% of the systems market, with all others competing for the rest and attaining between 3% and 8%, he said.

As a result of its recent reorganization along the lines of industry applications, Oelman said NCR salesmen who previously were limited to particular products now may sell an entire line of products needed in certain types of applications such as retail department stores or supermarkets.

Ansi Unit Backs IBM Interface

WASHINGTON, D.C. – IBM's 360/370 input/output interface design has received another boost from the American National Standards Institute (Ansi) subcommittee on I/O devices in the lengthy process of becoming thc designated U.S. I/O standard.

Thc suhcommittee, X3T9, recommended the IBM document detailing the interface design be used as a basis for a proposed standard and discarded an alternate Japanese proposal, according to Delbert L. Shoemaker, chairman of the I/O devices subcommittee and chief of the standards branch in the General Services Administration's Automated Data and Telecommunications Service.

The next step is for the subcommittee to review the document, commcnt on it and probably put it out on letter ballot after its next meeting the week of Dec. 5.

The subcommittee will then determine whether to submit the matter to Ansi X3 as a proposed standard, he said.

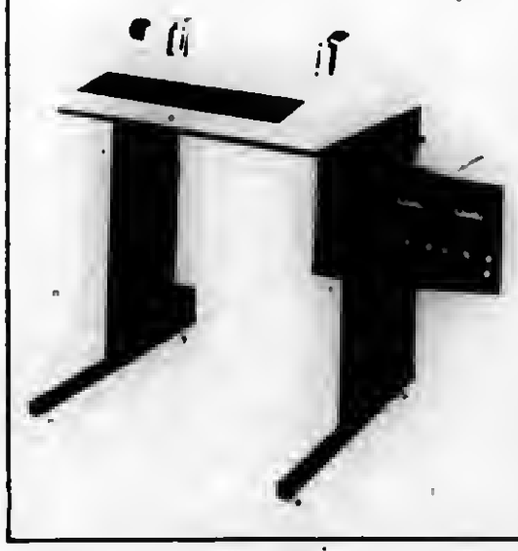
The proposal needs a two-thirds majority approval by letter ballot from about 15 individual members on thc subcommittee, Shoemaker said.

The Ansi and X3 procedures for processing a standard require that the subcommittee get the proposal technically to a point where it feels it should be taken to X3 for a vote, he said.

Allowing time for the mail vote, conceivably the proposal could be sent to X3 in February or March, he said.

Jack Biddle, director of the Computer Industry Association (CIA), said his organization of independent computer companies "heartily endorses" the Ansi action.

"An I/O standard is long overdue," he said. "The IBM 370 is the worldwide de facto standard, and it's about time we adopted it formally," he said.



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Core Sues Centronics for Monopoly

By a CW Staff Writer

NEW YORK – Core-Computer Related Equipmcnt Ltd. of England, former distributor for Centronics Data Computer Corp., has filed an antitrust suit against Centronics in the latest round of dispute between the two firms.

Centronics termed both this action and the previous suit filed by Core against it as "spurious and without merit," calling them delaying tactics to prevent Centronics from collecting the $1.8 million owed for goods delivered.

Broke Contraets

The latest suit, filed in federal court here, alleged Centronics attempted to monopolize trade in printers; required Core to agree to unreasonable restrictions as a distributor; broke contracts; and tried to put Core out of business, among other charges.

This action followed a suit filed by Core in July in New York Supreme State Court that sought $10 million in compensation and damages from Centronics [CW, July 30].

Centronics said that suit was voluntarily withdrawn by Core in August, shortly before a hearing was scheduled on its motion for summary dismissal.

The July suit was a "diversionary, delaying tactic to prevent the liquidation proceedings instituted by Centronics to assist in the collection of the $1.8 million" owed it, the New Hampshire-based printer firm said.

Centronics said it is proceeding with its action for the liquidation of the assets of Core in Great Britain.

The firm has instituted a direct sales program in Britain.

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Telefile to Go Ahead With Plan To Acquire Xerox Lease Base

By Nancy French
Of the CW Staff

IRVINE, Calif. – Honeywell, Inc.'s assuming responsibility for servicing and marketing Xerox's computers will not affect Telefile Computer Products, Inc.'s decision to add as many Xerox users as possible to its lease base [CW, Oct. 22], S.V. Edens, Telefile president, said in an interview here last week.

"It won't really have any impact on what we're doing at all because we were already turned off by Xerox when we made our decision to work through the users," he said.

Edens will sell his plan to users at a series of meetings in the U.S. and overseas.

The first such meeting is scheduled for Nov. 3 in Los Angeles, followed by another Nov. 5 in Detroit, a third in Philadelphia on Nov. 7 and a fourth in London on Nov. 10.

"We're offering support, new peripheral equipment, core memory and maintenance – the same kind of thing that was apparently set up with Honeywell," he said.

Although Edens maintained the agreement will not affect Telefile in the relative short term, he said he doesn't know what effect it might have in the long run. "I do think right now some customers are going to sit back and say 'I've got to wait and see what's going to happen with Honeywell,' so we'll lose some orders that we would have picked up in the next few months," he said.

Eden's objective is to keep the Xerox product line alive as long as possible, he said, and to buy as many of the $80 million to $100 million worth of Xerox computers presently on lease as he can.

"I calculated that, based on the trade-in values I have offered users [CW, Oct. 22], the CPUs alone would cost us $6.9 million," he said.

This $6.9 million would be spread out over a period of about seven years, "so it's not really a very big expansion on our part," he said.

"By adding peripherals to it, however, we assumed we would get about 20% of those 150 Xerox systems out there, increasing our business by about 30% per year over the next two years.

However, at this point, Edens is looking for a growth in Xerox business for three years and then a decline for the next four, he said.

"If I could make the business last 10 years, we could have slower growth for a longer period of time," he said.

"My own personal opinion is there is still a high degree of probability that [the Xerox-Honeywell arrangement] will not happen because as I understand it, the agreement is only a letter of intent and it will not take effect until Jan. 1.

However, "this is an area of business in which Honeywell has been very good at in the past . . . it's an extension of its third-party maintenance organization."

"I don't know how many companies it actually does third-party maintenance for, but Data Recall, for example, and some of the people who were in the old core memory business used Honeywell for third-party maintenance," he said.

"If it does go through, Honeywell might even be negotiating with us at some point because we're still out there very aggressively pulling those machines into our lease base, and I expect to pick up some more during those user meetings," he said.

A public company, Telefile shipped an estimated $5 million in equipment for fiscal year ended Sept. 30.

Although the books have not yet been audited, the firm is "profitable," Edens stated.

Because Telefile has had "four very good years of operation," banks are happy to extend cash to finance programs such as the Xerox computer acquisition, Edens said, and even computers from manufacturers that are out of business provide "good solid collateral," he said. "It's just the risk factor that you have to worry about."

In addition to Xerox-compatible equipmcnt, Telefile makes a line compatible to almost every company's, except IBM's equipment, he said.

"We also make communications systems, so Telefile doesn't have to depend on Xerox business to last," he said.

Contracts

Business Systems Technology, Inc. (BST) has received an expanded service contract from Sorbus, Inc. which includes maintenance of BST peripheral product installations in Hawaii.

Compuscan, Inc. has received a contract to manufacture for and sell optical character recognition data entry wands to the First National City Bank of New York. The contract agreement contains provision for payment of royalties by Compuscan to the bank on sales to specified markets once certain sales volumes have been achieved.

Cyphernetics Division of ADP Network Services has received a three-year contract extension from Chase Econometrics Associates, Inc. to provide services covering econometric modeling, forecasting and data base services.

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Moves to Vertical Integration

Data General Adds Home-Grown RAM to Nova 3

By Molly Upton
Of the CW Staff

SOUTHBORO, Mass. – By introducing its home-made N-channel 4K random-access memory (RAM) as a component in its Nova 3 semiconductor memory [CW, Oct. 22], Data General Corp. (DG) has extended its trend toward vertical integration and become one of the first mini makers to reduce the gap between semiconductor houses and mini makers.

Other firms have worked with custom designs of MOS devices made outside their own facilities, but DG's 4K chip is produced in its own Sunnyvale, Calif., facility.

Although DG engineers originally thought in terms of a 22-pin RAM, they decided 20 pins would offer more advantages, according to John Scanlon, marketing specialist for processor products.

With vertical integration, DG's memory engineers worked with its semiconductor designers to specify optimum trade-off points in a system sense with regard to speed, functionality, chip size and ease of use in Nova 3 systems.

In addition to system integration, there is the advantage of increased inventory control, Scanlon said.

The Nova 3 memory is compatible on a board level with Texas Instrument's 22-pin assembly, he added. "If you want a second source, you go with standard parts."

Scanlon would not give performance specifications on the chip except to say the firm is "making conservative use of the chip" in the Nova 3. With semiconductor memory, the Nova 3 has a memory cycle speed of 700 nsec.

"We're pretty proud of the chip," he added.

Although the 4K RAM is currently scheduled for inclusion only in the Nova 3, a general-purpose 4K RAM is "useful," he said.

The only other DG CPU to use semiconductor memory now is the Eclipse series, he said.

DG is providing the chip only for internal use, as opposed to OEM sales, he said.

Most of the MOS memory devices available now are P-channel. N-channel devices give "inherently higher performance," Scanlon said.

Three years ago when DG started its MOS development efforts, N-channel was not known to be easy to control, "but in retrospect we took the right step."

The increase in speed comes from the fact electrons have inherently higher mobility than holes, the firm said. In N-channel technology, switching action is caused by controlling the flow of electrons from source to drain regions, whereas P-channel relies on the movement of holes or absence of electrons to facilitate switching.

Having semiconductor capability is "mandatory to retain cost structures in the long term," he remarked. DG makes more than the 4K RAM, he added, including the sense amp and clock driver as well as a large proportion of the bipolar transistor-to-transistor logic (TTL) used in computers.

At the low end of the market, where price is critical, in-house capability gives the low-cost supplier flexibility for cost structures, he said.

Using an asynchronous processor, the Nova 3 can handle both core and semiconductor memory, he observed. This should prove useful in applications where users wish to keep the program in core and use the MOS portion for performance, Scanlon added.

"We're interested in how orders will break down" between core, semi and combinations, he said.

Scanlon cited volatility as one problem in gaining user acceptance for MOS, but there is also technological skepticism, he said. The community has seen semiconductor suppliers run into trouble meeting their announced supply schedules, he explained.

Discounts are by CPU family at DG, so an OEM could retain his discount while choosing from a variety of capacities and technology, either semi or core, he remarked. The Nova 3 has up to 128K.

Aimed at OEM Mart

The Nova 3, aimed at the OEM market, represents a renewed effort on DG's part to answer the question of what the firm is doing for the OEM.

Traditionally DG grew up as an OEM firm, Scanlon said, and then it pursued the end-user market with more system software and the Eclipse.

The trend during the past year has been even more toward the end-user side of the industry.

He observed there is beginning to be an upturn in the OEM market, and "a lot of new OEM commitments are starting," he said.

DG expects the Nova 3 will replace the Nova 2 for new OEM customers. At the low end, about 4K, the Nova 3 is priced about 35% below the Nova 2 and costs about 20% less than the Nova 2 for about 32K, he said.

Major Mainframers to Continue to Shop For Peripherals at Specialty Houses

LOS ANGELES – Major computer manufacturers will continue to buy from "specialty" firms to cut their costs, Ryal Poppa, president of Pertec Corp., told investors here recently.

"The challenge is to manufacture a vital computer peripheral at less than a major manufacturer could produce it himself. That keeps the giants buying from you – not competing.

"Of course, the small firm must be able to build in healthy profit margins, too," he added.

"As some minicomputer manufacturers become more deeply involved in the design and production of end-user systems, the manufacturer reviews the potential of producing his own peripherals," Poppa said.

"He does this because he needs an increasing number of peripherals to offer his customers – and he thinks he can capture 20% to 40% of the system cost – our profit," he said.

Applications More Customized

"However, the manufacturer of computers most often finds computers are becoming more and more customized in their applications. This means he must produce peripherals to do a very specific, narrow job," he observed.

"And in-house manufacturing won't support all of the costs of a specialized product. So, major manufacturers turn to specialists like Pertec.

By supplying many market segments with a given peripheral, we can sustain economic manufacturing volumes with good gross margins," he said.

After Poppa joined Pertec in 1972, product lines were streamlined, costs cut and some significant long-term contracts were negotiated, he said.

"We did this in preparation for a dramatically changing computer industry in the 1970s," Poppa explained. "I expect revolutionary changes to occur in data communications," with telephone lines obsoleted by satellites as a means of data communications.

"Yet, tape drives, disk drives and minicomputers will still be a major, integral part of these vast networks," he predicted.

Poppa said he believes the computer industry is just now entering its adolescence.

"There is tremendous growth yet to come," he forecast.

"In all the years through the end of calendar 1973, about 90,000 minicomputers were shipped. In 1974 alone, there were 50,000 shipped.

"This year, it will total 70,000. Obviously, the growth is exponential, and it doesn't appear to have any clear ending.

"The cost of computers, and particularly minis, are coming down so fast we are finding new applications and a rapidly broadening base."

CDC Switched to Data Services Because of IBM Competition

(Continued from Page 35)

perhaps one of the most successful computers ever built – IBM attorneys asked whether this was the same 6600 IBM has "clobbered."

Norris also said CDC's shift in emphasis from computer manufacturing to data services was based on the belief services such as time-sharing are growing at a faster rate than the large installed business computer systems segment of the industry. CDC has tried to convince customers to use its data services rather than purchase or lease systems made by IBM, Norris said, adding the company has gained customers as a result of this strategy.

Some disagree with the CDC approach, Norris said. As an example, he mentioned those who now see distributed processing that utilizes disbursed minicomputers as a favored approach.

Acquisitions and joint ventures form yet another approach to competing in a marketplace dominated by one company, Norris' testimony indicated.

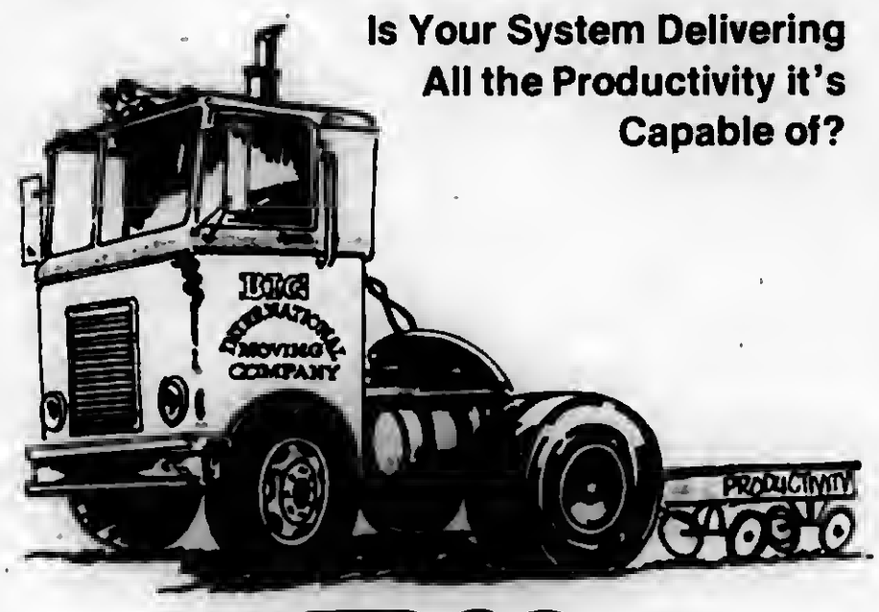
Commercial Credit Corp. is acknowledged to be CDC's most significant acquisition, Norris said. Without this company, CDC would have been hard-pressed to finance computer leasing, in particular, he said. Commercial Credit helped bring financial stability to CDC in addition to adding new dimensions to the corporation's business strategy, he added.

Through this acquisition, money became available that couldn't be obtained from any other source. By retaining an "A" credit rating, Commercial Credit could borrow at a lower rate of interest and, by thus reducing costs, increase its net income.

When Norris gave a speech to the business school at the University of Minnesota in 1973, CDC and Commercial Credit had combined assets of $4.5 million, IBM attorneys pointed out.

Joint Efforts

Joint ventures are used extensively as a strategy to meet competition successfully in the marketplace as well, Norris said. Currently, CDC has a research grant of $25 million from the Canadian government and a joint venture with the government of Rumania to manufacture some peripheral equipment. It owns a company with NCR and ICL called Computer Peripherals, Inc. that makes magnetic tape unit card readers, printers and mass memories. CDC also owns a company with ICL, Plessy and Nixdorf to manufature semiconductors and a company with Honeywell that manufactures rotating mass storage devices, he said.



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MINNEAPOLIS – Honeywell, Inc. reported third-quarter earnings were up 29.1%, but nine-month earnings were down 32.1% for the period ending Sept. 30.

Third-quarter earnings were $14.8 million or 75 cents a share, compared with $11.4 million or 59 cents a share a year ago.

Earnings for the nine months were $32.7 million, or $1.67 a share, compared with $48.1 million or $2.50 a share reported last year.

Total third-quarter revenues were $669.9 million, compared with $621.2 million reported a year ago, and revenues for the nine months were $1.96 billion, a 7.5% increase over the $1.86 billion showing reported last year, the firm said.

Honeywell President Edson W. Spencer said the company was pleased with the improvement in its third-quarter profits, but did not regard the quarter as an indication of a rapid turnaround in its worldwide business.

Cites Improvement Trend

"We are encouraged by the modest improvement trend since the first of the year, which shows profitability in the second and third quarters better than the preceding periods, he said.

Computer rental and service revenues for the quarter were $192.6 million, an 11.7% improvement over results reported a year ago for both the quarter and the nine months, Spencer added. Purchase revenues improved in the third quarter and were slightly ahead of last year's nine-month period, he said.

Net bookings in the computer business in the third quarter were less than the record second quarter, but they were equal to last year's third quarter and continue ahead of 1974 on a year-to-date basis. Backlogs continue ahead of a year ago at this time.

In France, negotiations are continuing on the merger of Compagnie Honeywell Bull with Compagnie Internationale pour l'Informatique and Honeywell hopes these negotiations can be completed this year. If so, the merged company will be in operation by the end of the first quarter.

"The upturn of our third-quarter order pattern in most segments of the company supports our hope that the recession has bottomed out, but it is nevertheless true that economic indicators important to Honeywell's business have shown no sharp upward moves," Spencer said.

Recovery Gradual

"In this period of recovery, many of the inflationary pressures upon Honeywell and its customers remain. It appears economic recovery will be gradual, but we are not disturbed by the pace of the recovery since too rapid a rate would cause more inflation, which we believe continues to be the most serious threat to real growth."

The most positive elements in Honeywell's increased third-quarter profitability were the continuing demand for cost and energy-saving systems for existing commercial buildings that more than offset the low level of new construction in this market, an improved order rate for residential products, considerable demand for process control systems from the power-generation industry and the improved contribution in operating results from the company's computer business, Spencer said.

Memorex Quarter Net Rises On 19% Increase in Sales

SANTA CLARA, Calif. – Memorex Corp. reported sharply improved earnings on a 19% increase in revenues during the third quarter and a switch to $12.2 million in earnings for the nine months compared with a loss of $6.4 million during the year-ago period.

President Robert C. Wilson said the outright sale of equipment and the conversion of leased equipment to sale continued to contribute significantly to revenue growth and to the improved profit and cash performance.

He also cited cost-improvement actions throughout the company and declining interest costs as significant factors.

For the third quarter, earnings jumped to $4.4 million or 91 cents a share, including a $1.7 million tax credit, compared with earnings of $513,000 or 12 cents a share in the same period last year.

Although there were no extraordinary credits in the same 1974 period, about $900,000 was credited to 1974 results because of a reversal of interest expense that had been charged to second-quarter operations, the company said.

Revenues for the quarter reached almost $67 million compared with $56.2 million in the year-ago period.

During the nine months, there was a $7.1 million special credit, including debenture purchase and tax credits.

Revenues for the nine months rose to $194.2 million compared with $158.1 million in the same period last year.

Wilson said the company's cash and short-term investments were $29.1 million as of Sept. 30, an improvement of $8.6 million during the quarter.

Indebtedness to senior lenders was reduced by $16.9 million during the quarter and now aggregates $127 million.

Shareholders' deficiency has decreased from $23.7 million on Dec. 31 to $4.5 million on Sept. 30, Wilson said.

The major factors in reducing shareholders' deficiency were the favorable profit performance, the exchange of debt for preferred stock and the ability to satisfy interest obligations to senior lenders by the issuance of preferred stock, Wilson said.

Calcomp Loss of $12.4 Million For Year Attributed to Write-Offs

ANAHEIM, Calif. – California Computer Products Inc. (Calcomp) showed a loss of $12.4 million for the year. About two-thirds of the loss was attributable to the write-off of investments and abandoned product lines, principally advances in anticipation of an agreement to purchase the Braegen Corp., a terminal maker, President Lester L. Kilpatrick said.

Revenues also dropped for the year ended June 30 to $122.9 million compared with $129.9 million last year.

The loss of $12.4 million or $3.83 a share compared with earnings of $8.7 million or $2.84 a share last year when there was a $3.3 million tax credit.

"It became evident in a tight money market that capital required to make the acquisition [of Braegen] profitable in the long term could be more judiciously used elsewhere," Kilpatrick said.

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Earnings Reports

ALGOREX DATA
Year Ended June 30

	1975	a1974
Shr Ernd	.....	$.07
Revenue	$1,682,099	2,132,819
Tax Cred	.....	65,000
Earnings	(205,705)	129,208

a-Restated for accounting change.

KALVAR
Three Months Ended July 5

	1975	a1974
Revenue	$2,259,270	$1,843,722
Disc Op	(32,683)	48,902
Loss	123,373	123,339

a-For 14 weeks.

KEYDATA
Year Ended July 31

	1975	1974
Shr Ernd	$.17	.....
Revenue	13,478,000	$11,670,000
Spec Item	a200,000	b(2,405,000)
Earnings	452,000	(2,992,000)

e-From tax-loss carryforward. b-From change in accounting method.

NATIONAL SEMICONDUCTOR
Four Months Ended Sept. 21

	1975	1974
Shr Ernd	$.40	$.46
Revenue	82,386,000	75,120,000
Earnings	5,241,000	5,506,000

NATIONAL DATA
Three Months Ended Aug. 31

	1975	1974
Shr Ernd	$.09	$.08
Revenue	8,308,000	7,595,000
Earnings	482,000	420,000

REDACTRON
Year Ended June 30

	1975	1974
Shr Ernd	.....	$.34
Revenue	$19,747,315	16,223,900
Tax Cred	.....	192,000
Earnings	(1,285,662)	402,096

DIGITAL COMPUTER CONTROLS
Three Months Ended Aug. 31

	1975	1974
Shr Ernd	$.08	$.03
Revenue	2,504,061	2,635,000
Earnings	118,458	53,101
6 Mo Shr	.13	.06
Revenue	4,843,454	4,956,863
Earnings	207,920	94,945

ANACOMP
Year Ended June 30

	a1975	1974
Shr Ernd	$1.11	$.78
Revenue	8,922,391	6,031,078
Tax Cred	370,031	253,000
Earnings	884,914	526,775
3 Mo Shr	.36	.26
Revenue	3,134,358	2,095,961
Tax Cred	120,031	98,000
Earnings	316,608	194,056

a-Preliminary; includes results of EDP Corp. acquired March 1975 on a purchase basis.

ANALOG DEVICES
Three Months Ended Aug. 2

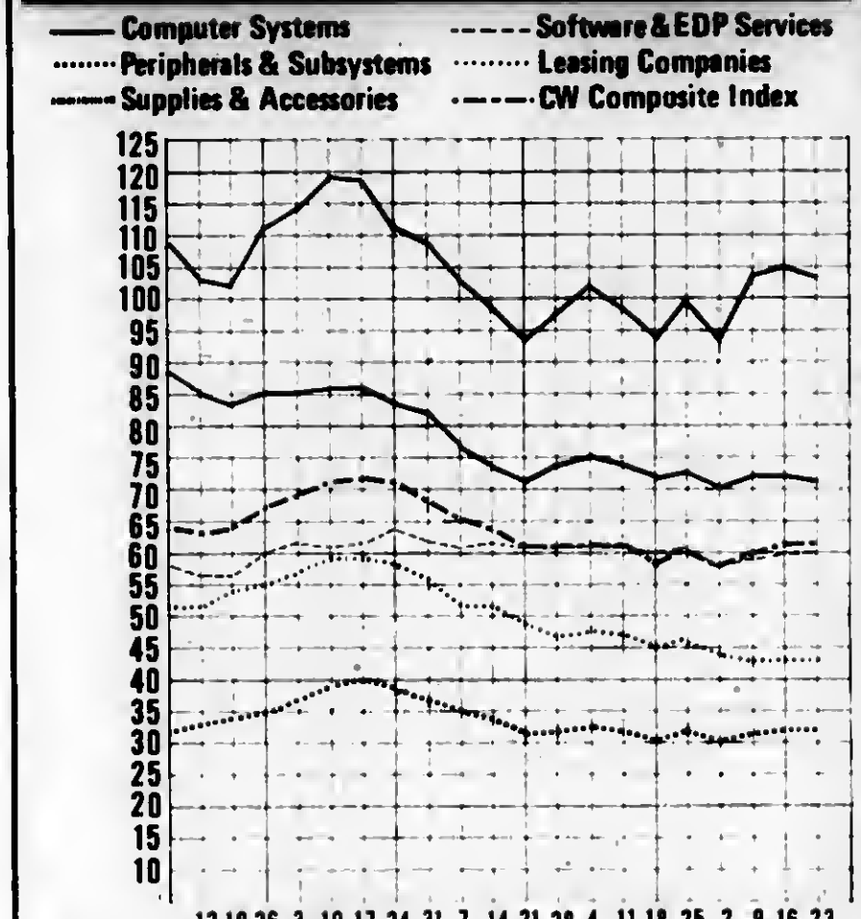
	1975	a1974
Shr Ernd	$.25	b$.31
Revenue	7,548,408	8,157,410
Earnings	374,904	444,341
9 Mo Shr	.67	b.88
Revenue	22,293,718	22,249,816
Earnings	967,893	1,246,389

a-Restated to reflect change to Lifo accounting method for certain inventories. b-Adjusted to reflect 5% stock dividend in March 1975.

WESTERN DIGITAL
Year Ended June 30

	1975	1974
Shr Ernd	.....	$1.64
Revenue	$11,610,000	13,386,000
Spec Cred	.....	723,000
Earnings	(3,515,000)	2,200,000
3 Mo Shr	.....	.79
Revenue	3,212,000	5,171,000
Spec Cred	.....	278,000
Earnings	(2,057,000)	1,053,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 22, 1975

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE (1)	CLOSE OCT 22 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	87 7/8	-3 1/8	-3.4
O	COMPUTER AUTOMATION	2- 10	10 3/8	+ 1/8	+1.2
N	CONTROL DATA CORP	11- 23	19 3/8	- 7/8	-4.3
N	DATA GENERAL CORP	10- 38	37 3/8	- 1/2	-1.3
O	DATAPOINT CORP	6- 26	24	0	0.0
O	DIGITAL COMP CONTROL	1- 4	2 3/4	0	0.0
M	DIGITAL EQUIPMENT	46-135	129 3/8	-2 1/8	-1.6
N	ELECTRONIC ASSOC.	2- 3	1 3/4	- 3/8	-17.6
A	ELECTRONIC ENGINEER.	5- 10	8 5/8	- 1/4	-2.8
N	FOXBORO	23- 42	27 5/8	- 1/2	-1.7
O	GENERAL AUTOMATION	4- 14	4 1/8	- 1/2	-10.8
C	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	58-120	101 1/4	- 3/8	-0.3
N	HONEYWELL INC	22- 40	34 1/8	+2 1/4	+7.0
N	IBM	158-224	213 1/4	+4 1/2	+2.1
O	NEWBREX	1- 10	8 7/8	- 5/8	-6.5
O	MICRODATA CORP	2- 6	5 3/4	- 1/8	-2.1
C	MODULAR COMPUTER SYS	5- 19	10 1/4	-1	-8.8
M	NCR	15- 39	25 3/8	+1	+4.1
O	PRIME COMPUTER INC	2- 6	5	+ 1/4	+5.2
N	PERKIN-ELMER	16- 30	26 5/8	+ 7/8	+3.3
N	RAYTHEON CO	26- 59	55	-1 1/8	-2.0
N	SINGER COMPANY	10- 17	11 7/8	+ 1/8	+1.0
N	SPERRY RAND	26- 49	42 7/8	+ 1/4	+0.5
A	SYSTEMS ENG. LABS	1- 5	2 7/8	- 1/4	-8.0
N	VARIAN ASSOCIATES	7- 18	15 3/8	+ 7/8	+6.0
N	WANG LABS.	7- 17	11 1/4	- 1/8	-1.0
M	XEROX CORP	51- 86	58 5/8	-3 1/8	-5.0
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	2 1/2	- 3/4	-23.0
A	CONNECTICUT GROUP CORP	2- 4	2 1/2	- 1/8	-4.7
A	COMPUTER INVESTORS GRP	1- 2	5/8	+	+10.0
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	0- 1	3/8	-	-14.3
N	DPF INC	3- 6	4 1/2	0	0.0
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT.	1- 5	4 1/8	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 1/2	- 1/8	-4.7
A	ITEL	3- 9	6 7/8	+ 3/8	+5.7
N	LEASCO CORP	4- 8	7	+ 1/4	+3.7
O	LEASPAC CORP	0- 0	1/4	0	0.9
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	MRG INC	0- 4	1/2	0	0.0
A	PIONEER TEX CORP	2- 7	6 5/8	+1	+17.7
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	8 3/8	+ 1/4	+3.0

EXCH		1975 RANGE (1)	CLOSE OCT 22 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	T/8	0	0.0
A	APPLIED DATA RES.	1- 10	1 1/2	- 1/4	-14.2
N	AUTOMATIC DATA PROC	29- 65	59 7/8	+ 1/2	+0.8
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	CENTRAL DATA SYSTEMS	3- 7	7 3/8	0	0.0
O	COMPUTER DIMENSIONS	2- 6	3	0	0.0
O	COMP ELECTION SYSTMS	3- 7	6 3/4	+ 3/4	+12.5
C	COMPUTER HORIZONS	1- 1	3/4	- 1/4	-25.0
O	COMPUTER NETWORK	1- 3	3 1/8	+ 1/4	+8.6
M	COMPUTER SCIENCES	2- 6	5	0	0.0
C	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
O	COMPUTER USAGE	2- 4	2 1/8	- 1/8	-5.5
O	CONSHARE	3- 4	2 5/8	- 1/8	-4.5
O	DATATAB	1- 2	7/8	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
M	ELECTRONIC DATA SYS.	12- 28	14 7/8	- 1/4	-1.6
O	INFONATIONAL INC	1- 1	1/8	0	0.0
C	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
O	KEANE ASSOCIATES	2- 3	2 3/8	0	0.0
O	KEYDATA CORP	2- 3	2	0	0.0
C	LOGICON	3- 5	3 1/2	0	0.0
A	MANAGEMENT DATA	1- 3	1 3/4	- 1/8	-6.6
O	NATIONAL CSS INC	6- 14	11 1/2	- 1/8	-1.0
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	12 1/4	-1 1/4	-9.2
N	PLANNING RESEARCH	2- 6	3 5/8	- 1/8	-3.3
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	3 5/8	+ 3/4	+26.0
O	REYNOLDS & REYNOLD	10- 24	15 1/2	+2	+14.8
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/8	0	0.0
O	TYMSHARE INC	7- 21	19 1/8	+ 5/8	+3.3
A	URS SYSTEMS	2- 4	3	9	0.9
N	MYLV CORP	2- 4	3	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	8 1/8	0	0.0
O	ADVANCED MEMORY SYS	1- 7	5 1/2	0	0.0
N	ANPEX CORP	3- 7	5 1/2	- 1/8	-2.2
O	ANDERSON JACOBSON	1- 3	2	+ 1/4	+14.2
O	BEEHIVE MEDICAL ELEC	1- 5	3 1/2	+ 1/8	+3.7
A	BOLT,BERANEK & NEW	5- 13	9	- 1/8	-1.3
N	BUNKER-RAMO	4- 8	4 3/4	- 1/4	-5.0
A	CALCOMP	4- 7	4 1/4	+ 1/2	+13.3
O	CAMBRIDGE MEMORIES	2- 5	2 5/8	9	9.0
N	CENTRONICS DATA COMP	7- 25	17 7/8	-1	-5.2
O	COGEX CORP	15- 38	35 1/2	+ 1/2	+1.4
C	COGNITRONICS	1- 2	3/4	0	0.0
O	COMPUTEK COMMUN.	1- 2	5/8	- 1/8	-16.6
O	COMPUTER CONSOLES	3- 7	4 1/4	+ 1/4	+6.2
A	COMPUTER EQUIPMENT	1- 2	1 5/8	+ 1/8	+8.3
O	COMPUTER MACHINERY	1- 2	1	0	0.0
C	COMPUTER TRANSCEIVER	1- 2	7/8	+ 1/4	+40.0
O	COMTEN	2- 5	3 5/8	+ 1/4	+7.4
N	CONRAC CORP	12- 26	25 1/2	+2 1/4	+9.6

EXCH		1975 RANGE (1)	CLOSE OCT 22 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 3	1 1/4	0	0.0
O	DATA 100	5- 16	10 1/8	- 5/8	-5.8
A	DATA PRODUCTS CORP	2- 6	3 7/8	+ 1/8	+3.3
O	DATA TECHNOLOGY	1- 3	1 1/2	+ 1/8	+9.0
O	DATUM INC	1- 2	7/8	- 1/8	-12.5
O	DECISION DATA COMPUT	4- 7	3 5/8	- 3/8	-9.3
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
C	DIMAN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & N	1- 3	1 5/8	+ 1/8	+8.3
O	FABRITEK	1- 1	7/8	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	3- 6	3 1/2	- 1/4	-6.6
M	HARRIS CORP	18- 28	28 1/4	+2	+7.6
A	INCOTERM CORP	3- 12	9 1/4	- 3/4	-7.5
C	INFOREX INC	2- 5	2 3/4	- 1/8	-4.3
O	INFORMATION INTL INC	8- 14	13 1/2	- 1/4	-1.8
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	NILGO ELECTRONICS	8- 24	16 1/4	-1	-5.7
N	MOHAWK DATA SCI	1- 5	3 1/8	- 3/8	-10.7
O	OPTICAL SCANNING	1- 3	2 5/8	0	0.0
O	PENRIL CORP	2- 2	1 1/4	+ 1/2	+66.6
C	PERTEC CORP	2- 8	4 1/2	0	0.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
C	PRECISION INST.	1- 1	1/4	0	0.0
O	QUANTOR CORP	2- 6	3 3/4	- 3/8	-9.0
O	RECOGNITION EQUIP	2- 9	6 1/2	- 3/4	-10.3
N	SANDERS ASSOCIATES	3- 11	7 1/2	- 1/4	-3.2
C	SCAN DATA	1- 3	1 5/8	0	0.0
C	STORAGE TECHNOLOGY	6- 17	13 1/2	- 1/2	-3.5
O	SYCOR INC	5- 16	16 1/4	+1 1/2	+10.1
C	T BAR INC	3- 6	6	- 1/4	-4.0
O	TALLY CORP.	1- 5	3 1/8	0	0.0
O	TEC INC	1- 4	3	0	0.0
N	TEKTRONIX INC	18- 43	41	+1 1/2	+3.7
N	TELEX	1- 3	2	- 1/2	-20.0
O	MANGCO INC	4- 9	6 7/8	- 5/8	-8.3
O	MILTEK INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 1/2	0	0.0
A	BARRY WRIGHT	5- 7	5 3/8	- 5/8	-10.4
O	CYBERNATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	31	- 3/4	-2.3
O	DUPLEX PRODUCTS INC	12- 25	15 1/4	- 1/4	-1.6
N	ENNIS BUS. FORMS	5- 7	4 7/8	0	0.0
9	GRAHAM MAGNETICS	5- 10	8 1/2	+ 1/2	+6.2
O	GRAPHIC CONTROLS	8- 21	13 1/4	+ 1/4	+1.9
N	IN COMPANY	43- 68	59 1/4	+1 1/4	+2.1
O	MOORE CORP LTD	39- 51	44 1/2	- 1/4	-0.5
N	NASHUA CORP	10- 22	9 3/4	-1 7/8	-16.1
O	STANDARD REGISTER	11- 20	16	0	9.9
9	TAB PRODUCTS CO	4- 8	5	0	9.9
M	UARCO	17- 24	19	+ 1/2	+2.7
C	VANIER GRAPHICS CORP	4- 7	4 1/2	0	9.0
A	WABASH MAGNETICS	3- 5	4 1/8	+ 1/8	+3.1
N	WALLACE BUS FORMS	15- 25	16 5/8	- 1/4	-1.4

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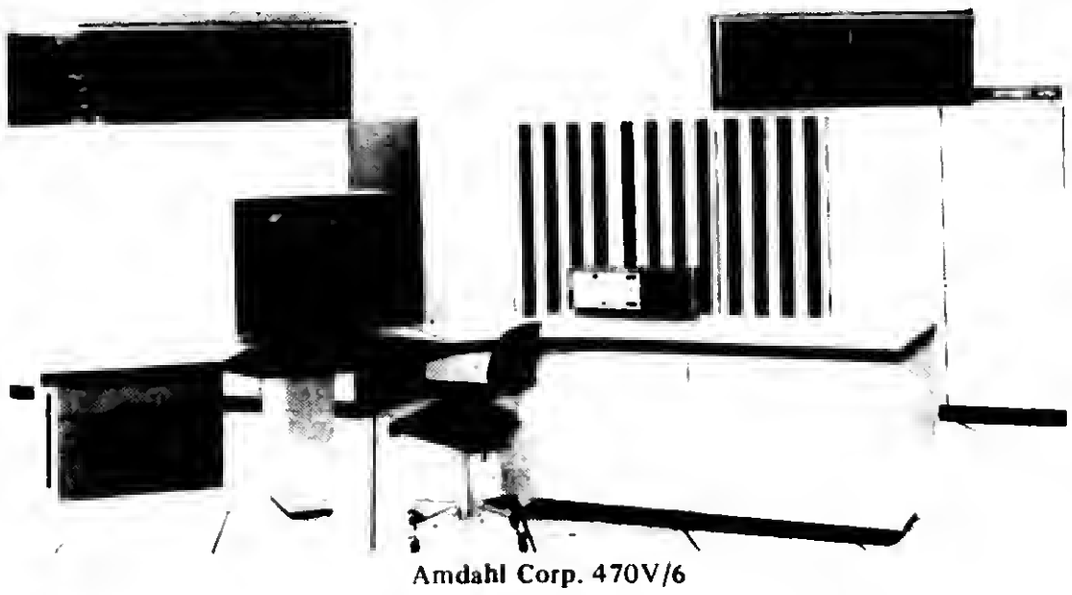
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NEWSPAPER



Amdahl Corp. 470V/6

Amdahl Ends Silent Years With Unveiling of 470V/6

By Patrick Ward
Of the CW Staff

SUNNYVALE, Calif. – Amdahl Corp. broke years of silence last week when it introduced a general-purpose computer that it described as software- and hardware-compatible with the IBM 370/168, but about 100% faster.

In addition, the firm announced two sources of lease financing for the system, designated the 470V/6.

The formal unveiling of the 470V/6 marked the first product announcement from the firm that Gene M. Amdahl, former IBM Fellow and manager of architecture for the System 360, founded five years ago.

Fujitsu, which has given Amdahl both technical and financial support (see related story on Page 35), is building the 470V/6 in Japan and will market it in much of the world.

Amdahl Corp. does not intend to build smaller CPUs, nor does it "have any immediate plans to . . . sell peripherals or to challenge the de facto standard of IBM software," according to Eugene R. White, Amdahl president.

While the 470V/6 and 370/168 share "logically similar" internal architectures, he described the 470 as a "fourth-generation" computer because it uses Large-Scale Integration (LSI) circuitry rather than the small-scale integration circuitry found on a 370/168.

The higher LSI packing density (50- to 100 circuit/chip vs. 5 circuit/chip on the 168) cuts wire travel time loss. This is the principal reason why the 470V/6 offers a 32.5 nsec cycle time compared with the 168's 80 nsec cycle time, the company said.

(Continued on Page 3)

Nuclear Plant Licensing Based on Dubious Data?

By John Hebert
Of the CW Staff

CAMBRIDGE, Mass. – There may be serious errors in official computer predictions used to license large-scale nuclear power plants, Carl J. Hocevar, an engineer with the Union of Concerned Scientists (UCS) here, said recently.

Experimental tests performed in May and August at Aerojet Nuclear Co.'s Idaho National Engineering Laboratory (Inel) raised new doubts about the safety of large nuclear reactors, Hocevar said.

The Inel tests underscored Hocevar's conviction "that the government has misrepresented the adequacy of its computer predictions of nuclear plant safety," he said.

The main thrust of Hocevar's allegations are found in a recently published study he authored entitled "Nuclear Reactor Licensing – A Critique of the Computer Safety Prediction Methods."

"In August 1974 the Atomic Energy Commission released a draft of a Reactor Safety Study (RSS) which was undertaken to assess the risks of accidents in commercial nuclear power plants," the report stated.

"There are serious questions as to the validity of the methodology employed by the RSS group to identify all possible accidents and quantify the probabilities of serious accidents," it continued.

"Adequate amounts of appropriate data do not yet exist for current-generation reactors since the commercial operating experience for large power reactors is very limited," the report stated.

Simulation Used

Computer simulation models are central to the issue of reactor licensing, Hocevar said.

The models depict the controllability of plant accidents by verifying the quality and adequacy of emergency core-cooling systems (ECCS), he said.

The models at present are used exclusively to determine plant safety – a substitute for testing these emergency back-up cooling systems under actual accident conditions, he explained.

The Nuclear Regulatory Commission (NRC) supplies mathematical descriptions, which are used to develop computer codes depicting the performance of

(Continued on Page 2)

Could Lead to Mail Strike

DP-Based Postal Plan Nears Showdown

By Patrick Ward
Of the CW Staff

PORTLAND, Ore. – The U.S. Postal Service and the National Association of Letter Carriers (Nalc) are moving toward a showdown over a computerized work-measurement system called the Kokomo plan [CW, FEb. 12].

The Postal Service had planned to put the plan into operation in Portland's Rose City Station after seven months of tests. Now, however, the decision on whether to implement it will be made by a board of arbitration which will begin study of the issue on Nov. 19.

If the arbiters decide in favor of the Postal Service, there is some danger of a strike, Nalc President James E. Rademacher said.

The Kokomo plan, named for one of its test sites, "is a method of evaluating work in order to get every route as close as possible to an eight-hour day," a Postal Service spokesman said.

The plan involves measuring the volume of mail, distances, terrain and the number of steps, boxes and other factors in a particular mail-delivery area.

The Postal Service then keypunches the data for a computer system which lists the work value of that particular area. Local postal supervisors can use the results to plan routes that take neither more nor less than eight hours to complete, the Postal Service spokesman said.

"I think it will generally show the need for fewer letter carriers if implemented nationwide," the spokesman added.

The Rose City test has been successful, he said. The station had 41 full-time and three part-time carriers compared with the current 38 full-time and one part-time carriers, he said.

However, rising overtime at the station more than makes up for the people who have been transferred out, Rademacher said.

Half of the newly designed routes now take nine- to 10 hours a day, he said. The employees have protested, but the Postal Service "is sticking to that system to the bitter end," the Nalc president said.

"Morale is terrible. I had to go out there last week to avoid a strike," he said.

Half of the employees have transferred out of the Rose City Station since the Kokomo plan testing began. The other half want to get out, Rademacher said.

"We haven't found anything to indicate that people are hidding off the routes," the Postal Service spokesman said. He also denied overtime is significantly higher than before.

Elsewhere in the U.S., postal supervisors evaluate a route by going around it with the letter carrier once a year.

(Continued on Page 2)

DP Investment Focus Of Next Year's Forum

NEWTON, Mass. – The Computer Users' Forum for 1976 will focus on "Optimizing the Data Processing Investment," according to the program's organizers.

The forum, which is the management education portion of the Computer Caravan, will comprise a half-day's activities on each of three days in the nine 1976 cities.

The second portion of the day will be devoted to exhibitor-sponsored seminars, and an exhibition will run concurrently with all these sessions.

As a result of feedback from previous years' attendees, several new topics have been added to the forum program, Edward J. Bride, forum director, noted.

The new topics include audit software

(Continued on Page 2)

CDC Winchester-Type Modules Priced 25% Less Than IBM Units

By Nancy French
Of the CW Staff

MINNEAPOLIS – IBM users considering a shift to Winchester-type data modules will soon have an alternate source at 25% below the purchase price of IBM's 3340s.

The CDC 33401 and 33441 disk modules, offered by Control Data Corp. to the OEM market last May, will be made available to end users in the second half of 1976, the company said.

In addition to a purchase arrangement, CDC will offer the modules on a monthly lease basis, including maintenance, at about 15% less than IBM's Extended Term Plan, the company said.

Like the Winchester, both drives use sealed canisters to store from 35M to 280M bytes of data that are read by moving heads contained in the module.

In addition, module options offer either .5M or 1M bytes of fixed-head, zero seek time data per module for tasks such as job queues or indexes that require high-speed data access.

Both CDC drives operate with the company's 38302 storage controller as well as the IBM 3830-2 controller and Integrated Storage Control (ISC) for the IBM 370/145, 158 and 168 CPUs.

The 38302 controller also permits users to connect the 33401 and 33441 drives to the CDC 38500 mass storage system announced and demonstrated in May.

The CDC 33401 device uses any of three removable data modules available as 35M- and 70M-byte moving-head models and a 70M-byte version with .5M bytes of

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Basis for Licensing Reactors Questioned

(Continued from Page 1)
the ECCS, to independent testing facilities such as Inel, Hocevar explained.

Two types of codes are developed from the descriptions, he said.

The first computer code incorporates assumptions concerning the highly complex and interacting factors involved in an accident of the ECCS. This code, known as the evaluation model, is used as a basis for reactor licensing, he said.

A second computer code is a non-assumptive model called the best estimate code, which is used as a partial basis for the evaluation model, he continued.

"The government has not changed the first set of codes, which is the crucial one," he stressed.

NRC did modify the mathematical descriptions used in the best estimate model after the operating temperature was found to be 250° F higher than was estimated, Dr. Herbert Kouts, director of the Office of Nuclear Regulatory Research of NRC, said.

As the best estimate codes are tested and improved, it leads to the improvement of the evaluation model codes, Kouts said.

The tests are run to determine the degree of conservatism in the best estimate computer codes. A greater degree of conservatism is built into the evaluation model codes, Kouts said.

"There has been no modification resulting from the recent Inel tests. We feel we understand that part of the descriptions," Kouts explained.

Although test results have been the same during the accident phase now that the temperature modifications have been made to the best estimate code, Hocevar's study results and government results continue to differ in depicting normal reactor operation, Hocevar said.

"It would take a big nuclear reactor accident for the government to change the code standards it sets on evaluation models used in the licensing process," he said.

"Nobody really knows at this time how frequently accidents in nuclear reactors will occur.

"There will be 1,000 reactors in this country by the turn of the century if industry and the President get their way," he said.

Data Bases Needed

"Large data bases are needed from which to draw information. We need to know what the failure rates will be on all major safety systems components in large nuclear reactors," Hocevar said.

"They do not now exist, nor does anything like them," he said.

"The government has invested a hell of a lot of money in nuclear reactors, and careers are at stake, and maybe we've gone too fast with it," he said, explaining the reluctance to modify the computer codes.

"We've put the cart before the horse" by building and then testing, according to Hocevar, who worked at Inel for seven years developing the computer prediction methods used by the government in nuclear plan licensing.

"There's a lot we could do to make the reactors safer than they are now," he concluded.

'Optimizing DP Investment' Set As '76 Caravan Forum Theme

(Continued from Page 1)
and data security, distributed processing, evaluation of service bureaus as alternatives to in-house systems and career pathing as a management aid, he said.

As in the past, the general format for the forum will be case-study presentations by local end users and consultants. In each city, computer users and consultants will relate how they solved a particular problem or implemented a software package or piece of equipment, Bride explained.

This year's schedule calls for all four workshops to be conducted before lunch; the workshops will be repeated so more than one workshop can be attended each day.

The 1976 Caravan will again feature a wrap-up panel following the workshops, but this session will also be held before lunch so attendees can spend the entire afternoon visiting the exhibits and attending exhibitor seminars.

Under an overall theme of "Management Overview," the opening-day workshops will focus on problems by installation size.

The use of an in-house computer vs. service bureaus for small organizations will be the focal point of one workshop, while developing career paths for programmers and operators in medium- to large-size installations will be the topic of another.

Other first-day workshops will look at minicomputer projections for the rest of the '70s and equipment and financing alternatives, including independent peripherals and third-party mixed systems.

Software will be the center of attention on the middle day in each city, specifically "protecting and controlling your DP investment through software," Bride said.

Workshop topics for the second day will include audit software and other aspects of data security, data base management packages and software as a measurement tool.

The final day's sessions will concentrate on computer networks for business and administrative users.

The Computer Caravan, which is sponsored by Computerworld, Inc., will open in Boston March 2-4. From there it will travel to New York, Washington, D.C., Atlanta, Detroit, Chicago, Dallas, Los Angeles and San Francisco.

Postal System Facing Showdown

(Continued from Page 1)
"There is no specific standard in the field today. The route assignment is determined by the individual's endurance," Rademacher said.

This makes more sense than expecting a young, 6 ft 3 in. letter carrier and a much shorter, older or less robust person to work the same kind of route, he said.

"Under the plan these factors don't come into consideration; everyone is to assume the same pace," he said.

Part-Time Help

The Postal Service said it plans to assign part-time help to carriers who, for one reason or another, need it to complete their routes.

The Kokomo plan would save the Postal Service the time and expense of having its supervisors walk the carriers' routes once a year, the spokesman said.

And it would allow local supervisors to use hard data in judging routes, rather than working from the subjective impression of what a route looked like on a particular day, the Postal Service spokesman said.

If a new apartment building changes the work value of a particular area, the Postal Service could just update its data base to reflect the change in that area's work value, he said.

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Amdahl 370/168-Compatible CPU Said to Be About 100% Faster

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The LSI circuitry also promotes reliability and reduces bulk so a fully installed Amdahl 470V/6 system is one-third the size of a 168, the company added.

Beyond the circuitry differences, the 470V/6's approach to cache memories, overlapped execution and multiplicity of instructions differs from other large CPUs, Amdahl said.

The 470V/6 comes with 16 standard channels in any combination of byte, block or selector, compared with 12 channels available on the 168, Amdahl said.

The Amdahl machine also differs from the 168 in that it is air-cooled and does not require water chillers or plumbing.

Amdahl Strategy

Amdahl's strategy is to offer IBM 360/370 users a cost/performance advantage while preserving the user's software investment, White said.

The compatibility is such "that in any situation where an IBM 370 or 360 is running any set of programs, using any peripheral mix, the 470V/6 can be substituted with no more changes than the user would have to make in moving from one 370 model to another," the company said.

The company may or may not deviate from the path of compatibility when IBM announces its Future Systems.

"It depends on whether we think we can do something better and we'll make that decision then," he said.

Amdahl has currently delivered machines to a National Aeronautics and Space Administration (Nasa) site in New York City, the University of Michigan [CW, Oct. 15] and to Texas A&M University.

The 470V/6 at the Nasa site was in full operation five days after delivery, the Michigan system was running programs 33 hours after delivery and the Texas A&M machine was turned over for production use in 14 hours, Amdahl said.

The 470V/6 at Nasa passed that agency's 30-day acceptance test with 99% uptime, White added.

Field service for current and future Amdahl users will be local and on-site, White said.

The company is also offering the services of the Amdahl Diagnostic Assistance Center (Amdac), which operates out of the company's headquarters here. Amdahl mainframes utilize a minicomputer-based operator console, and Amdac allows local technicians to hand over control of the 470V/6 to technicians at the Amdac minicomputer.

Those technicians can then test about 16,000 operating points remotely, Amdahl said.

The 470V/6 sells for between $3.7 million and $6 million. DPF, Inc. has provided Amdahl with $160 million in lease financing for commercial customers and Municipal Leasing Corp. of Denver plans to provide $20 million in lease financing for state and local government and state university contracts, Amdahl said.

Amdahl is at 1250 E. Arques Ave., 94086.

Amdahl Bullish on Big Machines

SUNNYVALE, Calif. – With IBM's Future Systems (FS) looming and minicomputers infiltrating every corner, this may not seem like a very auspicious time to introduce a large computer.

But Gene M. Amdahl, founder of the company that bears his name, feels FS is far enough off to leave space for his company's entry, the 470V/6.

"Even after FS comes out, there will be time before users want to convert to it," he said.

Amdahl is also "very confident about large machines" despite challenges from minicomputer and microcomputer technology.

He pointed to the large size of the corporations involved in transaction processing. "Their data bases normally require sequential integrity. They have to have a central data base, and the transactions have to be fast enough to maintain that sequential integrity."

In other words if Message A empties an inventory, Message B must not carry back word that the product is still available.

Minicomputers in a ring configuration are no faster than their slowest link, Amdahl said, and would not be as adept in handling a sequential series of instructions as a large mainframe.

Minicomputers fit into the picture by providing a local, human-scale DP source, he said, with a large machine as the central source of information.

CDC Modules to Cost 25% Less Than IBM

(Continued from Page 1)

fixed-head capacity, CDC said.

This fixed-head approach allows fast access to data with no time delay because of head positioning motion.

Each 33401 holds two modules and operates with a pair of drive motors, two sets of load/unload controls and two voice coil motors and servo control circuits.

The capacity of a 33401 subsystem with a single 38302 controller ranges from 70M to 2.24G bytes of data.

The CDC data modules are fully interchangeable with IBM 3348 units and include disks, access arms and read/write heads in a single cartridge, the company said.

Since the head recording data on a disk is always the same one that reads the information back to the computer, it eliminates misalignment of the heads and tracks.

CDC said the data module drive provides a major advantage over the IBM 3350 and 3344 fixed-head drives since the module can be moved to another drive in case of failure.

The 33441 has a capacity of 280M data bytes with 1M byte of fixed-head, zero seek time capacity optional.

Both modules can be used with Virtual Storage IBM 370/135 through 168 systems under the control of OS/VS1 and VS2 and VM/370.

The drives are also supported by DOS/VS.

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Edelstein Returns IBM Papers Asking End to Gag Rule

By Edith Holmes
Of the CW Staff

NEW YORK – Judge David N. Edelstein recently returned IBM's papers asking an end to the gag rule in the government's antitrust suit against the corporation [CW, Oct. 22].

Explaining IBM counsel had failed to file the papers requesting he vacate Pretrial Order 4 in accordance with his procedures for filing motions in this trial, Edelstein said the defense could correct its errors and resubmit its motion.

IBM had attached two third-party documents currently under an order protecting their confidentiality to the exhibits supporting its memo on the gag rule. Attorneys for IBM had ommitted a cover letter alerting the judge to the existence of this confidential material – an omission which could have resulted in the filing of private matters in the public file by accident, the judge said.

IBM has asked that Pretrial Order 4, which prevents the parties and their witnesses in this trial from discussing the case openly with the press and public, be revoked on three grounds.

First, it is an unconstitutional violation of the first amendment, particularly as a result of a precedent set by the decision of a case, CBS vs. Young, in the Sixth Circuit Court of Appeals this summer.

In addition, the defense said the order has been taken by the government and Judge Edelstein to mean IBM cannot communicate about this case with its shareholders and employees or respond to "false and unfounded" media statements.

Finally, Pretrial Order 4 is unfair to IBM because, while the corporation is barred from talking about the suit, the government's "consultants," the so-called Computer Industry Association, or CIA, have engaged in a massive propaganda compaign in the press and elsewhere against IBM, the defense papers stated.

CIA Files Cited

Attorneys for IBM cited recent discovery of CIA files as the source of much of their information.

Based on what they found in those files, IBM counsel concluded the association has acted in the capacity of consultant to the Justice Department and has used information gained in a private conference with Edelstein to launch a propaganda campaign designed to minimize the public notion that IBM stockholders would suffer from a breakup of the corporation.

Attachments to the IBM memo include various letters and communications between the CIA, its members and the Department of Justice, examples of what IBM considers "scandalous and false accusations in the press" and the notes of the conversation with Edelstein which allegedly took place on Nov. 13, 1972.

In those notes, the CIA commented it "would not wish IBM to be ahle to make concern for its shareholders the central gut concern of Judge Edelstein when relief is formulated."

The CIA member who talked with the judge felt he "could not state personal or CIA concerns regarding the merits of the case in a closed session," the notes said.

They then detailed Edelstein's desire to move the trial along as expeditiously as possible and his recognition that the case is perhaps "the most important antitrust case ever."

In contrast to the 15-page IBM memo with lengthy affidavits by both lead IBM counsel Thomas D. Barr and head corporation counsel Nicholas Katzenbach, the government's response memo was a brief two pages.

"Pretrial Order 4 reflects the court's concern that this already complex litigation not be complicated further by disputes over public statements by the parties and their attorneys, the governmcnt said. "In short, thls court has indicated its desire to have the case tried in the courtroom, rather than in the press."

Attorneys with the Justice Department noted the order was adopted at the request of IBM and that it has "helped to limit the distraction of extrajudicial comment between the parties and their counsel in this suit." "Until now, IBM has not questioned the constitutionality of the order," the government memo added.

However, if the order is revoked for IBM, the Justice Department asked that it be vacated for the government as well. "The Department of Justice is responsible to the citizens of the U.S., just as IBM's management is responsihle to its shareholders."

While the government's memo did not mention IBM charges of a connection between the Justice Department and the CIA, the lead government attorney Raymond M. Carlson told the judge the CIA had not been employed as a consultant during a recent "robing room" conference.

For its part, IBM noted it "does not seek to hold the plaintiff, its representatives or the CIA in contempt of Pretrial Order 4, although grounds for such a finding may be present."

No Tricks, One Treat

NEW YORK – Prior to last week's recess, rumor had it that – in addition to all the other holidays the court plans to observe this year – the judge hearing the U.S. government's antitrust suit against IBM intended to break for Halloween.

As usual, rumor was only partially correct. The court did recess for the week of Oct. 27 to permit Judge David N. Edelstein, the sole arbiter in the case, to attend a meeting of the Metropolitan Districts Chief Judges of Federal Courts.

Having engaged in numerous versions of "trick or treat" ever since the trial began last May, neither the government nor IBM needed a holiday for that purpose.

Perhaps the judge was afraid the parties would come to court that day disguised as each other – or worse yet, as themselves.

Terrorists Claim Responsibility for IBM Bombing

CHICAGO – One IBM Plaza here was among the nine government buildings, corporate offices and banks that experienced nearly simultaneous early-morning bomb explosions last week in New York and Washington, D.C. as well as Chicago.

As in all of the blasts, no one was injured at the IBM building when the bomb, placed outside on a plaza next to the windows of the lobby, exploded, a spokesman for the corporation said.

The explosion at approximately 1 a.m. (CST) did manage to shatter five windows, however.

IBM prepared no statement on the matter and turned the incident over to the Chicago police for investigation.

An underground terrorist group calling itself the Fuerzas Armadas de Liberacion Nacional Puertorriquena (FALN) or Armed Forces of National Liberation, claimed responsibility for the act. Statements by the organization indicate its members viewed the bombings as part of a "coordinated attack against Yanki govcrnment and monopoly capitalist institutions."

By the middle of last week, Chicago police reported they had made little progress in the case. Bomb experts believe the devices used here contained dynamite and were ignited by small propane gas tanks, a method used previously in this metropolitan area by the FALN.

DP Foul-Up Causes Issuance of Late Tax Notices

MARTINSBURG, W. Va. – An undetermined number of erroneous notices were sent to taxpayers recently because of a foul-up at the Internal Revenue Service (IRS) National Computer Center.

The notices assessed taxpayers for back taxes plus interest and late penalties on dividend income they allegedly didn't report in 1973.

The error was caused by the merging of magnetic tapes containing dividend information for certain companies for 1972 and 1973, so that dividends for both years were recorded as being dividends for the year 1973.

The merged tape, which is believed to involve only companies based in Tennessee, was sent to the Memphis Service Center. When the center compared its tape of tax returns for 1973 with the National Computer Center tape, it found apparent widespread underreporting of dividend income by individuals and started sending out notices.

The error was discovered late last month when complaints from corporations and individuals were received, but it is not yet known how or when the merge occurred.

The system is currently being checked out to discover exactly what happened, according to William E. Palmer, director of the National Computing Center.

The IRS also does not know exactly how many companies were involved or how many taxpayers were affected, although Palmer feels the incidences were "isolated."

However, other sources claimed at least eight companies were involved.

Correction

The captions under the photos of Dr. Gary Casper and Fred H. Harris were reversed [CW, Oct. 15, Page 10].

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Study by ABA Finds

DP Present in 92% of U.S. Banks, But Usage Varies

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – Ninety-two percent of all U.S. banks use or are planning to use computer systems. However, although the use of DP may be nearly universal, the way it is used is not, according to a study by the American Bankers Association (ABA).

Nearly all of the largest banks and 78% of medium-sized banks have in-house equipment. The figure drops to 16% for small banks, Per Lange, director of ABA's Surveys and Statistics Division, and Arnold Kaplan, assistant director of the Operations and Automation Division, reported in the September issue of *Banking*.

The survey was mailed to all U.S. banks with more than $50 million in deposits. Responses were received from 1,657, representing more than 70% of the nation's total bank deposits, the authors noted.

Sixteen percent of mid-sized banks and slightly more than two-thirds of all banks use off-premises facilities, but "whether this will continue is a matter of speculation," they said.

"The minicomputer is just entering the picture and is already being chased by the new, smaller microcomputer," they added, although no details were provided to back this observation.

Automation on Upsurge

The authors found "remarkable" growth in automated services that are visible to the public. Only 4% of all banks offered cash-dispensing machines in 1972, they said, but "this year, 8% do and within a year 13% plan such a service.

"Three years ago, only 2% of banks had automated tellers or teller-assisting devices," they added on a slightly different but related topic. "Today 25% do and that percentage will increase to 27% by 1976."

Despite the "legal uncertainty" now surrounding off-premises electronic fund transfer operations, the survey showed banks expect growth in this type of bank service.

The interest in such services, as a means of extending operations to a larger geographic area, is "most pronounced" among small banks, Lange and Kaplan found.

Increasing Chunk of Expenses

DP accounts for an increasing share of a bank's total expenses and, in general, the larger the bank, the more it spends – relatively – on DP.

The cost of DP ranged from 8.4% of total expenses this year for the largest banks to 6.8% for smaller ones. The rate of increase for such expenses was greatest, however, among smaller banks, indicating their DP involvement – while lagging behind that of larger institutions – is now increasing more rapidly."

Heavy use of commercially available remote-computing network services indicated banks do not perform all automated tasks completely in-house, even if they have their own computers. Indeed, the percentages suggested the larger banks – which are more likely to have their own gear – are more likely to use the outside services as well.

In the banks' own operations, on-line processing is rapidly superceding batch processing in many areas, particularly installment credit, savings accounts, credit card operations and financial information systems, according to the survey.

"At present, about 80% of major automated bank operations are handled in a batch mode," the authors acknowledged, but "within a year, 45% of these operations are expected to be on-line."

Perhaps related to the move to on-line operations, most banks believe they will have to replace their present computer systems within the next three to five years.

"Only 21% believe their present systems will still be in use five years from now," the analysts found.

IBM Leading Vendor

IBM leads all other hardware manufacturers combined as a vendor to the banking industry. This reflected a preference among the larger banks, the survey showed, since Burroughs and NCR ranked first and second as suppliers to small banks.

The next three years should see a "substantial increase" in systems and programming needs, the ABA reported: 54% of small banks, 74% of mid-sized banks and 77% of the largest institutions anticipate growth in these areas.

Services visible to the bank customer may be dramatically different three years from now, the study showed. At-home telephone bill-paying service will be commonly available by 1978, according to 26% of the banks, and 20% saw some other sort of bank-at-home service.

Thirty-five percent expect an automated program for banking-at-work will be adopted on an industry wide basis by then.

Copies of the "Results of the 1975 Operations and Automation Survey" (publication number 0671) are available for $50 for ABA members and $100 for others from the ABA, 1120 Connecticut Ave N.W., 20036.

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IT Returns to L.I. as Expanded EFTS

By Don Leavitt
Of the CW Staff

HEMPSTEAD, N.Y. – IT has come back to the north shore of Long Island.

The Instant Transaction point-of-sale electronic funds transfer system (EFTS), run experimentally by Hempstead Bank in 1971-72, has been reinstituted by the bank with new equipment and a broader scope of operations.

Participating in the starup of the new IT will be Hempstead Bank's 10,000 checking-account depositors and 35 varied retail merchants in six North Shore communities.

IT is based on an immediate transfer of funds from the customer's account to the merchant's account at the Hempstead Bank. Thus IT is neither a credit-card operation nor a check authorization process; the money is transferred right at the time of sale.

The merchants have Addressograph-Multigraph Amcat-I terminals which are linked to the bank's Burroughs B3500. The units read a magnetically encoded stripe on the back of a customers' IT identification card.

Authority for the bearer to use the card is validated when he keys in a secret number on a numeric pad attached to the terminal. The number is compared to a number previously selected by the card owner and stored in enrypted form in the customer's file.

Copper Wire

The original IT test was conducted only in the town of Syosset. Prototype terminals in merchant locations were activated by plastic cards with account numbers coded in holes like those on telephone dialer cards.

Just as now, the customer's authority to use the card was validated by his keying in a secret number.

If the key-in did not match the number etched on a copper wire embedded in the card, the card could not be used. And the bank could not tell the customer what the embedded number was if the original instructions that came with the card were lost.

The 1971-72 experiment was closed off after 14 months of operation to evaluate the results. Acceptance was good by both customers and merchants, but the "almost handmade" terminal equipment used in the experiment had considerable problems, according to Mike Bonacum of the bank's research department.

In 1973 there were still no terminals on the market with the facilities the bank wanted and it

(Continued on Page 7)

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Ralston Wants Afips to Be More Than 'NCC Purveyor'

By Catherine Arnst
Of the CW Staff

BUFFALO, N.Y. – The new president of the American Federation of Information Processing Societies (Afips), Anthony Ralston, has been "a relatively consistent critic of what Afips has done in the past" and will attempt to make the society "more than a purveyor of the National Computer Conference (NCC)" in the future, he said.

"Afips should be perceived as a spokesman for computer professionals," he said, adding it has been somewhat "ineffective in this role in the past."

Ralston hopes this situation will be remedied with Afips' Washington, D.C. office, which opened in June [CW, Sept. 10] and for which he pushed before he was elected.

Through the Washington office, Afips can "develop activities and contacts within the government so it can better represent there its constituent societies as well as feed information back to them," he said.

Ralston, who is currently a professor in the Computer Science Department at the State University of New York here, said he would also like to see Afips become more active on the international scene than it has been in the past.

He particularly mentioned participating in the International Federation for Information Processing (Ifip). Such particlpation has been minimal in the past.

Role of Coordination

Afips must limit Its activities, however, to ensure it does not compete with its 15 constituent societies, Ralston said.

"This has been a problem in the past," he said.

"Our role is one of coordination of the various societies' efforts, rather than direct action.

"Afips must recognize the areas in which it is limited and not spin its wheels, and it must recognize those in which it's not limited," Ralston said.

Education is one area in which Afips is limited, but social concerns is an area in which the federation could do a lot, he said.

Although he hopes Afips officials take public positions on issues, they should not represent Afips' position, as it is difficult to get all the member societies to agree on a stand, Ralston said.

Licensing is an issue on which Afips should not take a stand, as there is a great deal of dissension among members on this subject, he said. His own opinion is "nix" on licensing proposals now in existence.

"On the one hand, we have a lot of people in the industry who are not competent, and licensing could possibly weed them out. But a great deal of study is still needed" on this issue, he said.

Ralston did agree the public needs protection and also suggested DPers should not wait for licensing to be "foisted" on them.

Afips should develop closer relations with the Institute for the Certification of Computer Professionals (ICCP), which administers the Certificate in Data Processing (CDP) exam, but added "we shouldn't do this (certification) ourselves."

He is not optimistic that remedies can be found to ensure professionalism, however. "We need less people with tunnel vision about their needs and jobs and more who look at the wider scope," Ralston said.

Afips is a federation, and should not act as its own entity, he stressed.

It will be more effective in representing user interests as well as those of the scientific community now that the Data Processing Management Association (DPMA) has joincd, Ralston said.

In the past, Ralston had criticized Afips for many of the in-house, small research projects it conducted which he feels had little value for most uscrs.

Afips Publication

He is considering starting an Afips publication, which he hopes will not compete with, but rather complement, those put out by Afips' constituent societies.

Bank Reinstitutes IT; EFTS Expands in L.I.

(Continued from Page 6)

went back to a prototype of its own design – "an outstanding one," Bonacum added modestly, "but one we couldn't afford to build ourselves in the quantities we wanted."

Early in 1974, the Amcat was announced and that seemed to meet the bank's needs. It had printer capabilities so the customer got a record of the transaction identical to the one generated within the computer. This provided the positive control the bank wanted, Bonacum said.

No Errors Yet

Under test for the past 14 months, the units have not had a single read error, he added. They are being installed in merchant locations – "just the high-volume retailers – supermarkets, drug stores, large hardware locations" – and are polled regularly at 300 bit/sec.

There has been no change in the Cobol-coded application programs, but the communications handler has been rewritten for the poll-and-select environment. There are eight lines running from the computer center here to branches in the North Shore area.

The lines feed into "bridge" equipment – "in essence, multiplexers – but dumb ones. They have no intelligence" – at the branches.

Telephone lines from the merchants feed into the "bridges" to complete the system. Multiple bridges can be linked and, indeed, are being used so two towns can share one of the trunk lines back to the B3500.

The merchants are experiencing "excellent response times," Bonacum ventured, adding "from 3 to 5 seconds after hitting the send key, the clerk is getting the start of an answer.

"Considering that the unit has to read and transmit the 40 characters from the mag stripe in addition to everything else, that is not bad," he said.

The software is currently being upgraded so IT can be used to support a reverse transfer of funds to cover return of merchandise or possibly receipt of deposits for the customer's account through a merchant's terminal, Bonacum noted.

But this probably won't be practical for a single bank, he said, so Hempstead is talking to other banks in the area.



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Because of Privacy Legislation

Security No Longer 'Just Good Management Practice'

By Edward J. Bride
Of the CW Staff

MINNEAPOLIS – One of the results of current and pending privacy legislation is that people "are going to take security much more seriously" than when it was "just good management practice," according to Dan Magraw, assistant commissioner of administration for the state of Minnesota.

There are also some long-term and short-term savings resulting from the federal Privacy Act of 1974 and the Minnesota privacy law, Magraw told attendees at a session on the impact of privacy legislation at the recent annual conference of the Association for Computing Machinery.

These savings result from "our looking at just what data is being collected, making us answer the question 'do we need it?' " Magraw said.

In other words, privacy legislation may be experiencing one of its intended results – the diminished collection of some types of information, an attendee commented.

The session was sparked by an angry tirade which Minnesota State Sen. Robert Tennessen directed at Navy Capt. Grace M. Hopper.

Tennessen, a member of the federal Privacy Protection Study Commission, became impatient with Hopper when she asked about the commission's policy on interstate and federal-state exchange of salary information and about an attempt by one member of Congress to obtain personal information on an employee of the Defense Department.

When refused the personal medical information, the member of Congress, later identified as Rep. Bella Abzug, introduced a bill to permit members to have unlimited access to federal information, Hopper said.

"I don't like the military," Tennessen said. "You've been collecting information on people, and it's still being stored at Ft. Holabird, Maryland. You've said it was destroyed, but it wasn't."

Either ignorant of or ignoring the fact that the Navy has never been charged with this type of data gathering, Tennessen repeated, "You've still got that stuff at Ft. Holabird. You're not telling the truth."

Hopper had asked Tennesen how the commission would feel about congressional requests for medical information, which she described as "the most personal" type of information on file.

While medical information may be extremely personal, "so is personal, political activity," Tennessen shot back, recalling the Army's admitted data gathering of the late '60s.

He never replied directly to the question about whether the commission would try to prevent such congressional "snooping," but did say "I would hope that [snooping] would not happen."

In prepared remarks, Tennessen had expressed the view that the Federal government should pass "no more legislation than is absolutely necessary," leaving to the states the burden of defining and enforcing privacy policies.

Also a member of the Minnesota Privacy Commission, Tennessen acknowledged a weakness in the Minnesota law which states that data bank custodians should "attempt to notify" recipients of files when corrections have been made to files.

The provision of only attempting to notify means audit trails or logs of access are not required, he conceded in response to a question from the floor.

"We didn't know how much it would cost" to keep these records, he explained.

In discussing implementation of the Minnesota law, Magraw said the situation was "spotty at best." Some school districts and agencies are "not taking the Minnesota privacy law very seriously," he acknowledged.

Officials of some of the districts do not understand the legislature is not "requesting" certain procedures but that the law requires them, Magraw said.

Regarding the security issue, Magraw predicted that, as data base management systems get "more pervasive in the next 10 years," it will be easier to control access and beef up security. In fact, he commented, he is more concerned with the security of manual files.



CW Photo by E. Bride

Dan Magraw

Legal Complications Arise From Use, Misuse of DP

By a CW Staff Writer

MINNEAPOLIS – The legal complications surrounding both the misuse or failure to use a computer system are beginning to be clarified, but users may receive little comfort from the "clarifications."

Failure to use a computer, for example, may be tantamount to negligence if computers have proven useful for the application in question, but undue reliance on a computer can also be negligence, a panel member noted at a session at the annual confernce of the Association for Computing Machinery here recently.

All of the panelists were attorneys, but they kept their remarks free of "legalesc" in pointing out some specific legal dangers which computer users may face.

Susan Nycum of the San Francisco firm of Chickering and Gregory recalled a 1933 case involving the sinking of a tug boat that was not equipped with radar. Despite the fact that not all boats were equipped with radar at the time, the question of foreseeable harm and the existence of an accepted product which could help avoid harm (radar) were considered legally as "lack of due care."

This same situation could apply to the computer and business today, she suggested. Legal considerations would also include "other forms of negligence" as well as the failure to use a proven product, she indicated.

There is, however, another side to this coin, and Nycum recalled the 1967 case of an automobile manufacturer's credit-granting arm, which experienced errors in its billing system and failed to credit payments to the proper account.

After failing to correct the system, the company repossessed an automobile. Its owner, who had in fact been making payments faithfully, won a court case, with the judge declaring the finance company had not used common sense in repossessing the auto.

Bob Bigelow, editor of the monthly newsletter, *Computer Law and Tax Report*, said he and Nycum had spent some time last August with a judge who was hearing a similar case and, on inquiry, Bigelow found out that the same finance company was involved. The circumstances were apparently the same – failure on the finance company's part to properly credit the payment of bills.

Nycum advised the audience to "use your common sense" in deciding whether – and how – to use the computer. Just as a person would not want to pay a bill twice, he should not send out a bill if it has been paid, she noted.

She also suggested management should use its DP contract to establish a chain of nonliability with vendors. When a procurement is being negotiated, for example, responsibility for delivery, performance and other considerations should be clearly outlined in the contract, she explained.

If a package fails to perform, the user then has legal recourse to collect damages from the vendor.

Retention of Records

Among other hazy areas is the retention of records and specifically what form or medium is required for retention.

While the Internal Revenue Service now accepts magnetic tape and microfilm as valid media for records, Bigelow said, there can be a problem if lawsuits arise between companies or between a consumer and a company if the state or local jurisdiction has not specifically authorized these media for use as "evidence."

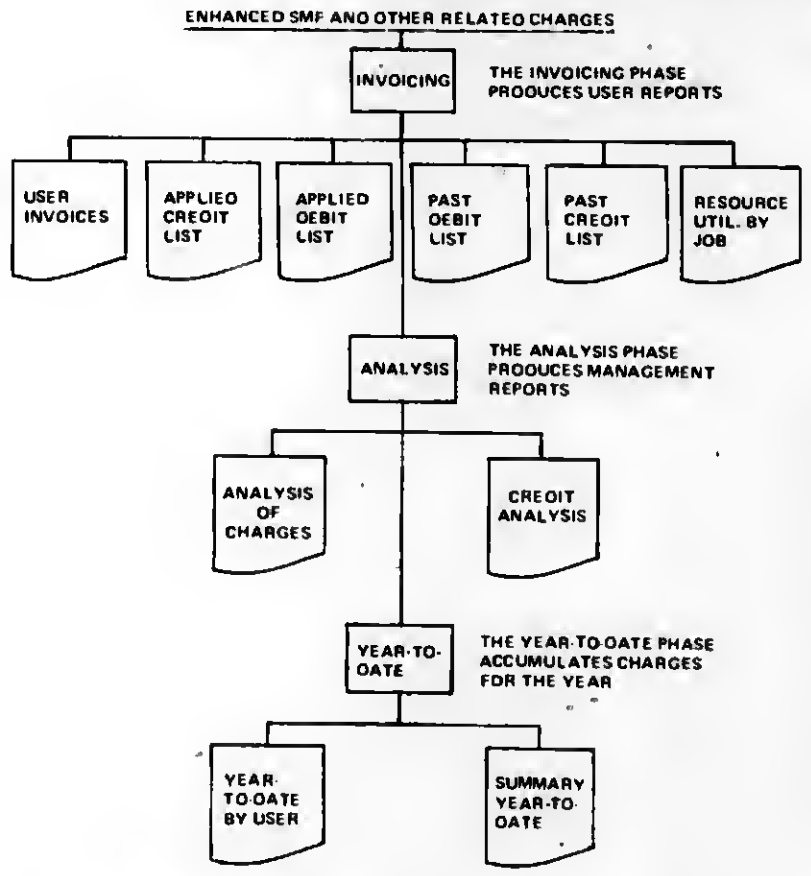
Philis J. Scaletta Jr. of Purdue University recalled a creditor who sued a consumer for failure to pay bills. The only evidence the credit card company had, however, was the magnetic tape of credit transactions and not the hard, signed copies of the transactions.

Under Indiana law, Scaletta related, this was not "evidence," and the judge threw out the case against the consumer.

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Inhibitions Increase Longevity of Big Operating Systems

By Molly Upton
Of the CW Staff

MINNEAPOLIS – Several factors contribute to the longevity of large manufacturer-designed operating systems – not the least of which are the expense and reluctance of both users and manufacturers to invest in changes, panetists at a recent conference here agreed.

In investigating the reasons why there does not seem to be more transmission of techniques from research facilities to the manufacturers, panelists at the Association for Computing Machinery's annual conference mentioned problems imposed by commercial realities, such as user reluctance, as well as various difficulties in developing operating systems.

In addition, the few operating systems built by researchers have been small operating systems, since it is rare to find the resources available to support a system through the shakedown phase, according to Butler Lampson of Xerox's Palo Alto Research Center.

Two Motivations

Acknowledging manufacturers' operating systems are probably 15 to 20 years behind research systems, William A. Wulf of Carnegie Mellon University suggested two possible external factors that might motivate DP makers to change their operating systems.

One would be a change in basic computer technology that would afford cost effectiveness of about three orders of magnitude, such as a very large number of microprocessors rather than one central processor, he indicated.

Another would be legislation – a privacy act, for example, which in effect would make it "legally dangerous" to use the current operating system.

Although Wulf was not sure either case would happen, it does appear that only large external forces will cause changes, he said.

Two factors that promote the status quo are that both manufacturers and users have significant investments in their opeating systems and most users would scream if the manufacturer changed the system radically, even if there was a significant improvement, he said.

Also, although there are some new ideas that could migratc to the manufacturers' operating systems, the fact is "it is not always easy to graft features. There are good reasons why Fortran does not have some nice features . . . they don't fit. An attempt to graft is bound to product a monster," Wulf said.

Large Systems Stable

Large operating systems are "enormously stable," Lampson observed. The evolution is slow and is conditioned by needs of compatibility and demands placed by users. Another factor contributing to stability is that the interface makes changes difficult.

tllustrating his point about stability, Lampson said the only major change in IBM architecture since 1964 has been virtual memory. Systems such as Scope, OS and DEC 8 are all 10 or more years old and substantially older than the hardware and most of the translators they use, he said.

F.J. Corbato of MIT said examples of systems that have impacted commercial systems are the CTSS and Multics projects.

CTSS, which was demonstrated in late 196t and used in 1963, served to demonstrate the feasibility of a time-sharing system and influenced manufacturers to believe there might be a market for such a system, but there weren't any immediate commitments to the idea, he said.

The Multics project was influential in several respects, he said. Since the researchers were forced to articulate their goals before starting – a then-novel approach for software designers – they set an example of early software engineering, he said.

The project established that one could and should realistically implement a system in a higher level language, despite the "ponderous languagyof PL/I," he observed.

Multics employed virtual memory and showed paging and segmentation as feasible objectives, Corbato said.

tt also put forth the idea that the difference between batch and time-sharing is one of degree and that it is possible to have both capabilities on one system.

The system exhibited early forms of structured programming with its high degree of modularity, about 1,000 to 1,500 modules, he said.

In addition, Multics tried to call attention to privacy and security and the importance of building in these safeguards at the start rather than as a patch at the end, Corbato said.

Part of the problem in influencing the manufacturer is the restrictions in the exchange of knowledge, Corbato said. Transferring people is one method, "but we don't have universal cloning yet."

tdeas are hard to describe in 1,000-word papers, and books are also difficult, he added.

tt is hard to approach manufacturers, because the "Not-Invented-Here" syndrome has to be countered, he said.

Corbato said he sees more progress in specialized systems than in general commercial operating systems.

Project Sue Lessons

Jim Horning, who was associated with the University of Toronto's Project Sue, gave some first-hand accounts of pitfalls encountered.

The project involved selecting various ideas incorporated in various laboratory operating systems and placing these on an IBM 360.

When taking solution A and adding it to idea B, those involved in the project wound up doing more extensive redesign than they had anticipated.

Project Sue assumed the researchers had solved wider problems than they thought they had, but discussions with the researchers showed this assumption was not necessarily valid.

At Project Sue, they saw small systems can live with restrictions that are unacceptable in larger systems. tn generalizing a solution one often destroys the simplicity and efficiency, hc said.

There is room for improvement in operating systems, panelists said, and one specific arca mentioned was in user interfaces.

Lampson said a good user interface requires a very different kind of skill from that needed to get a system up. The ideas are not new, but need fermenting.

It takes a long time before one can find a way of making things manifest so they seem as simple as using a typewriter. he said.

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Editorials

No DAAs

The sensible solution to network protection is now undergoing its initial phases in California [CW, Oct. 29] and should lead the way to a nationwide reform in the regulations regarding interconnection of non-Bell equipment with the nationwide telephone network.

Until now all computer users who did not stay with "Ma Bell" for their interconnect equipment were forced to rent a Data Access Arrangement (DAA) from that company.

Now in California the Public Utilities Commission is allowing non-Bell modem manufacturers to build DAAs into their systems and sell the complete package to the user. The built-in DAA is required to be certified by independent examiners and, once it is, there is no longer a need to use a Bell DAA and to continue to pay Bell for it.

The California plan should be implemented by other states and by the FCC on a national basis.

It assures protection for the network and at the same time frees computer users from unnecessary charges.

CW Needs Net Data

This month *Computerworld* will feature a supplement on data communications networks. If you are now operating a network or are planning one, please take a few minutes to fill out and return the survey below.

You may return it in the postage-paid subscription envelope stapled into this issue; just write "Editorial" on the outside of the envelope so your vote can be tabulated quickly.

We now operate a network that contains the following:

Type of terminals: Interactive____ CRTs____
Remote batch____ Intelligent____
Other _____

Type of line: Phone co.____
Mix of both____
Specialized carriers____
If special carriers, which ones?_____

Transmission: At what speed do you operate?_____
Do you have multiplexers or concentrators?____
How many of each?____

Is your net regional or national?_____
Dial-up or private lines?_____ Or both?_____
What are the major applications?_____

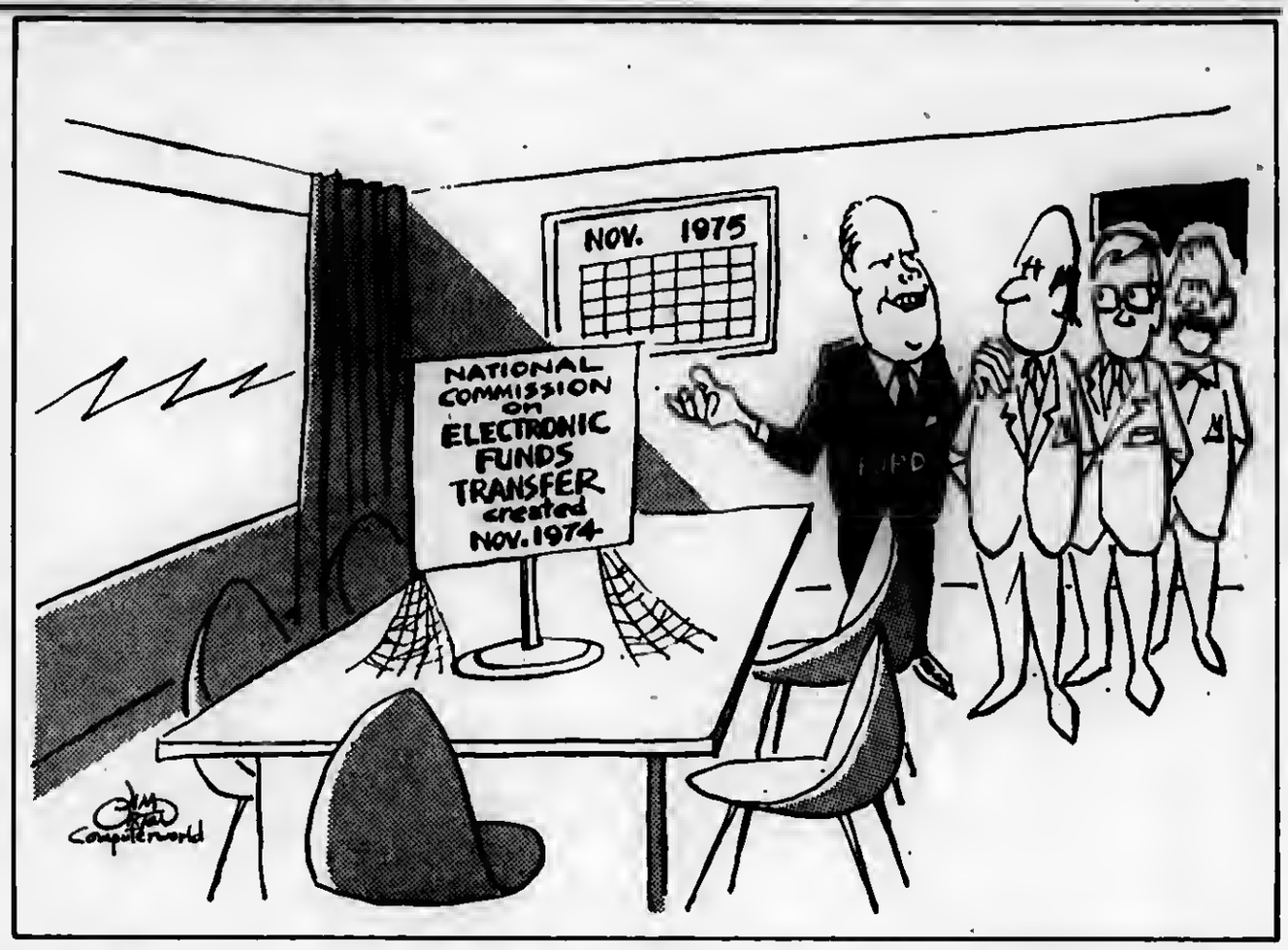
How many different vendors supplied the equipment in the net (modems, terminals, CPUs, etc.)?

What network upgrade are you planning in the next year?_____

What are your biggest network operating problems?

My job function is:
____ Programmer/Analyst ____ Management
____ Other ____ DP Management

Identification (Optional)
Name_____
Title_____
Company_____
Address_____
Can we quote you personally? Yes____ No____



'I'd Have Appointed You Gentlemen Sooner, But Now That I Know You Understand New York Is Off Limits . . . '

Letters to the Editor

Memorex MRX/50 Software Support Available From Independent Firm

In the Oct. 22 article concerning user satisfaction with the Memorex-50 hardware, I must take issue with the statement that "vendor software support is not available to the MRX/50 user.

Support of the released Memorex software product has been available and continues to be available despite the mid-1973 withdrawal by Memorex from the mainframe business.

Such support was first provided by Memorex through the end of 1973. During the last two years, the support has been provided by our independent company, Programming Research Associates.

It is true our company is not a vendor, but it does support the vendor software. We possess an MRX/50 system for use in investigating problems; we have the only complete library of Memorex source code and documentation; and the principal employees of the company are all former employees of Memorex in Minneapolis.

Being disassociated from Memorex does not diminish our capability of providing effective software fixes for reported problems.

Memorex, in fact, endorses our activities, having contracted with us to provide support for its base of lease customers. Independently, we offer the same support to the base of purchase customers.

The article failed to acknowledge the existence of any software support for the Memorex System. We recognize the energy spent by a few of us in support of the software may not be deserving of much recognition in the total DP community.

The number of individuals involved in the original development of the software was rather significant, however. The products developed by these individuals were, for the most part, quality products. (From our viewpoint, the current RPG compiler, which has had only three minor bugs reported in the past year, is certainly in better than "flaky" condition.)

A few words acknowledging the Memorex software is being improved, thus enhancing utilization of the system, would have been gratifying to those who devoted so much effort to their product, but were then denied the opportunity to observe, at first-hand, the acceptance and utilization of their product by the user.

Thomas A. Conley
Minneapolis, Minn.

Claims About 5100 Exaggerated

The announcement of IBM's new 5100 desktop computer [CW, Sept. 17] caused a flurry of excitement in our R&D organization. Its power looked very impressive. We envisioned using several to edit, reduce and store laboratory data for off-hours transmission to our host computer.

Then we read the fine print. The corporate arrogance of IBM rides again. The 5100 will not interface with laboratory instruments and it will not communicate (in Ascii) to our non-IBM host. Claims that the 5100 has a place in the scientific market are grossly exaggerated.

Charles R. Watson
Richland, Wash.

Simpler Check-Digit Method Used

We are using a check digit method which gives us 100% protection against single-digit errors and adjoining-digit transpositions and is less complicated than the method described by Alan Taylor [CW, Oct. 22].

We just divide the number by 11, convert the remainder to a letter and append that letter.

Pierre H. Berube
Keene, N.H.

Thank You, Herb Grosch

In reference to the column, "Women on Top," I would like to say: "Thanks, Herb Grosch! Couldn't have said it better myself!"

Margaret A. Denty
St. Petersburg, Fla.

College Seeks Data on Women

I have been following with interest the controversy over the rights and opportunities for women within our industry.

The Student Counseling Bureau at the University of Minnesota has been attempting to gather statistics on women in DP, in an effort to broaden the horizons of such women.

While we at the Society of Certified Data Processors (SCDP) have attempted to assist the bureau, returns have been minimal and the sampling of females in the industry has been woefully inadequate. To date, after several months of effort, the bureau has yet to gather sufficient data to obtain an accurate statistical sample.

So I encourage women who are willing to participate in this survey to obtain the data collection forms from Dr. Jo-Ida C. Hansen, director of the Student Counseling Bureau at the Office of the Dean of Students, Center for Interest Measurement Research, University of Minnesota, Minneapolis, Minn. 55455.

Kenniston W. Lord Jr.
President
SCDP
Washington, D.C.

(Other letters on Pages 11 and 12.)

Letters to the Editor

Generalizations Unfair to Women

When are men, such as Prof. Jack M. Wolfe ["Women Don't Want Promotions," CW, Oct. 15], going to stop generaliz_ng about women? When assessing a male, I'll wager Wolfe does not assume:

- He's a father.
- He might leave because his wife obtains employment in another city.
- He might want to change careers.
- He might consider social life important, etc.

Presumably he judges other men as individuals in their own right. When, oh when, are women going to be accorded the same privilege?

Marianne S. Mantle
Akron, Ohio

Basis Insufficient

In reply to Jack M. Wolfe's comments in the Oct. 15 issue of *Computerworld*, I wonder whether Wolfe feels his experience as one individual is a sufficient basis for his broad statement about "women" in general?

He stated: "The average period of employment of women programmers is noticeably less than that of the men." This contradicts the article on Page 8 of this same issue ["Management Problems Promoting Women Self-Imposed"] where reference is made to "statistics from the Department of Labor showing the average length of service by women is comparable to that of men."

The studies with which I'm familiar show the road upward is definitely harder for women as a whole. But only by judging on individual merit can our stereotypes of male and female be overcome, thus allowing us to choose the best person for a job.

Marcia Kolar
Glen Ellyn, Ill.

Needs Guidance Badly

The letter from Ed Tunstall [CW, Oct. 15] titled "Grosch Right: NCR Never Entered DP Mart" deserves a response because Tunstall evidently needs guidance desperately.

How can a real DP manager live with the situation he described without taking corrective action? Has he voiced his complaints to proper NCR and school district management?

He evidently knows how a computer should properly function, so why in the world has he settled for less over the past two years?

If Tunstall truly wants the NCR situation corrected and has exhausted all possibilities within local NCR management, he should pick up his phone and call William S. Anderson, chairman and president of NCR.

If his complaint is valid, Anderson will take corrective action, and I doubt if it will take him two years. And, once things are running smooth (as most NCR installations are), Tunstall can honestly call himself DP manager.

Al Hains
Santa Monica, Calif.

HEW and DOD

One of the first shockers to come out of Jerry Ford's Washington vis a vis the new security and privacy legislation is the disclosure that HEW intends to blatantly and shamefully violate the spirit of the law, and quite possibly the letter as well. Callously using as an excuse the notion that interactions between major subdivisions of the Department of Health, Education and Welfare are internal administrative matters, these ugly people intend to continue to transfer personal data at their convenience between the myriad data banks in their bureaucratic empire.

Note that these data banks exist in such itty-bitty outfits as the Social Security Administration (operator of what is almost certainly the largest bank of personal data in the western world), the National Institutes of Health, the education moguls, and so on.

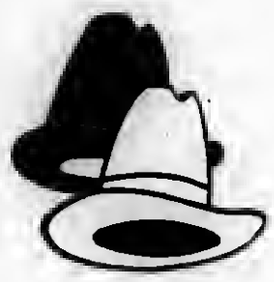
In defense of the majority of senior people involved, these policy and legal arguments must be clearly understood to be at the level of the Administration's political appointees, not down among the civil servants. The assistant secretaries and counsel involved are Nixon and Ford men, not careerists.

This is much less a factor in the Pentagon, where the strong armor of military dominance protects the occasional desire to do good, along with the usual desire to do well, and the frequent desire to crunch us up. As an example, I have read (with great difficulty, due to the almost impenetrable bureaucratese) the Navy and Air Force directives on personal data and privacy put out within DOD following activation of the Privacy Act of 1974. The Navy has already made a test application of the DOD instructions in its Office of Civilian Manpower Management, the Air Force has hired Rockwell International to do an analysis of the impact of the Privacy Act on its operations, and both services give every indication of cooperating through the Defense Privacy Board established by order of the Deputy Secretary last April.

DOD appears to mean business, and its data bank operators, no doubt wringing their hands and their budgets the while, are facing up to the great difficulty and expense of compliance. Maybe they're conning us: CW intends to keep watching. But the initial impression is very favorable indeed.

Contrast this with the HEW subterfuge and the corrupt support the early CW and ACLU reports indicate it received from Justice Department lawyers and from the Office of Management and Budget. I'm reminded in an entirely different context of the way that the Nixon OMB quietly emasculated the Brooks Bill by closing down the tiny group supposedly devoted to implementing the policy of efficient computer usage in the federal establishment, after Joe Cunningham retired.

Unless public protest via the Congress has an effect, no record will be kept of personal data transfers, legal or illegal or absolutely outrageous, between the data empires of HEW. To stimulate such protest, I sincerely hope that men and women inside and outside Washington who observe or have good evidence of such transfers keep the Civil Liberties people and the Nader types and the media (us!) on the alert. Evil, as I so often am forced to say, never sleeps. *Aux armes, citoyens!*



Herb Grosch

Error-Avoidance Method Requires No Check-Digit Use

Computers, when really put to use, have many different ways of reaching a desired result.

In the past we have been mainly concerned with adapting old methods to the abilities of the computer age. Now, however, it appears those old methods are going to have to be compared with brand-new methods which owe their practical existence to the computer's abilities.

The Taylor Report
By
Alan Taylor, CDP



A brand-new computer-age method of checking for transposition and transcription errors in account numbers, etc., which doesn't require any computed check digit, has come along in response to recent discussions in this column [CW, Sept. 17, Oct. 22].

Now an installation has two completely new alternatives to the traditional weighted-multiplication check-digit methods – the Deeds code-and-reduce system and this new one.

Like check digits, the aim is simply the avoidance of errors.

In the number-selection method, the technique is simply to use only those numbers that have checkable characteristics that are known in advance.

It is known, for instance, that any number that can be divided by eleven, if all but one digit is transcribed correctly, simply won't be divisible by eleven. Therefore, a system that issues only numbers divisible by eleven can be checked for single-digit transcription errors and the other characteristics of divisible-by-eleven numbers.

Double Safeguard

Such a system would have a double safeguard because, should an error creep through as a result of a programming fault, it would still not result in an item being posted to a wrong account, for instance. There simply wouldn't be any account number to which to post a wrongly transcribed number.

So not only is a check digit unnecessary, but the normal account-number matching logic does all the necessary checking of the results.

With such a system it would be possible – as DP Director Edward C. Marzo of Spartanburg, S.C., pointed out – to get all the advantages of the Modulo-11 check-digit systems without fitting 11 situations into a choice of 10 available digits.

It goes further, however, because it can also be used to exclude undesirable, error-prone cases from the series at minimum cost.

Take the case illustrated in the Sept. 17 column, where the transpositions 90 and 09 would not be caught by the 12121 weighted type of check-digit system. The accuracy of the system (that is, its ability to catch single errors or transpositions) could be improved by omitting from the series any number having either a "90" or a "09" string it it.

Other errors such as transpositions between the check digit itself if put into the last position and the adjacent units number of the system can be identified in advance.

The 12121 weighting system, for instance, fails to detect transpositions of 6 and 3, 5 and 2 or 7 and 4. This could be eliminated from the system simply by not issuing any number which ends with 6 and has a check digit of 3, etc.

Such a selection process could not reliably be handled prior to the computer age. The use of consecutive-number issuing was far less error-prone than any other available manual system. But in this day and age, where numbers are originally issued by the computer, use of selected numbers only becomes practical as well as desirable. The question now becomes what characteristics the numbers selected should have.

Other Systems

For instance, the principle is not restricted to Modulo-11 systems. Larry Pendarvis of Digitex Corp. compared the characteristics of Modulo-11 and Modulo-13 selected numbers (11, 22, 33 . . . vs. 13, 26, 39 . . . etc.). The Modulo-11 system does not catch errors involving transpositions over odd numbers of intervening digits, such as where 132 is written as 231. Both of the numbers divide evenly by 11, so the system would leave such errors undetected.

The only way to eliminate such a fault would be to arbitrarily select one or the other as being the only possible acceptable number. If, for instance, it was decided to accept only the smaller numbers, this would eliminate 50% of the available three-digit numbers, 67% of the available four-digit numbers, 80% of the available five-digit numbers, etc.

By contrast, the Modulo-13 system detects all single transpositions across any one, two, three or four intervening digits. And, on seven-digit numbers, the Modulo-13 system provides 759,231 protected numbers as against the 909,091 semi-protected numbers available from the Modulo-11 system. By way of contrast, Pendarvis pointed out the Deeds method of check-digit protection provides 1 million protected numbers under the same circumstances.

On the surface, this argument can go on and on with no end in sight. However, there appears to be some form of a limitation.

At the current state of the art, we can detect only single errors. How frequently double errors occur I don't know, but presumably a calculation based upon the number of detected single errors could provide some form of an upper limit for the occurrence of double errors.

With this estimated or established, it would be possible to identify how far it would be worthwhile to go in providing safe computerized account numbers under various systems.

All the systems could be compared on an apples-to-apples basis, and we could improve the efficiency of number control by bringing it into the computer age. And that would certainly be a great advance. More news soon – and please keep your letters on the situation coming.

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Letters to the Editor

'Software Program' Still Undefined After 17 Years

Without doing any more than the little research Roy N. Freed did for his Oct. 15 column, "Definition of 'Software Program' Can Vary," I would guess that few professionals in the field would concur with the proffered definition of "software program."

Perhaps Freed should first generate a suggested definition for "program," *then* get into subdefinitions of the noun as modified by such words as "software," "hardware," "hand-wired," "applications," "systems," etc. ad nauscum.

To me the compound term "software program" suggests a particular subclass of programs which are introduced to the computer from external sources and may be changed at will (from "soft") and are generally conveyed to the user by sale – bundled or unbundled, "systems" or "applications" (from "ware").

Let's hope Freed's future columns and other reader letters can clarify this confusion which has confounded me for 17 years.

E.K. Zimmerman

Washington, D.C.

Argument Nonsensical

After reading David A. Fuller's letter [CW, Oct. 8], I am forced to conclude that one or more of the following must be true:

- Fuller doesn't pay attention when he reads.
- Fuller goes into mental spasms when he sees certain words such as "abortion."
- Fuller has his data bus scrambled.
- *Computerworld* made up David A. Fuller to generate some controversy.

Whatever the true choice is, Fuller writes a pretty wild – and pretty distorted – letter. The first sentence of the article, "Passage of Abortion Law Credited to Mini Data" [Sept. 17] mentioned that Barbados passed an abortion law after receiving a projection of future population vs. food supply done on a computer.

That was one sentence out of 11-1/2 column inches. The remainder of the article carefully explained how the computer system was used to contrast projected population with projected food supply and projected energy supply, mentioning that these projections were given to the officials of the country concerned from whence they could draw their own conclusions to guide their planning.

From this, Fuller concluded that "it is unfortunate the minicomputer was used as a tool to generate fear – a selfish, depraved fear."

Fuller's major argument seemed to be to equate the fetus to the Negro in 1857 and to equate abortion to death and torture for black slaves. That argument may have a high emotional content, but it has absolutely zero rational value. It had no relation to the article in question.

Projections of that sort are really very simple. Given the situation which prevails, X number of mouths will need to be fed at some point in the future.

Barbados, very rationally, prefers population control to starvation . . . how it chooses to control its population is another question altogether.

There is absolutely no basis for believing in the bloody reign of terror Fuller insisted on conjuring up. His letter was nonsense.

Laurance F. Wygant

Schiller Park, Ill.

Courtney Speech Available

I read with interest the Oct. 8 Taylor Report, "Releasing Statistics Could Aid DP Fraud Prevention."

In the article, Taylor quoted Robert Courtney of IBM. I would like very much to obtain a copy of Courtney's speech.

W.M. Boardman

Orlando, Fla.

No printed version appears to be available, but a tape cassette of Courtney's speech can be obtained for $9 from the Data Processing Management Association (DPMA), 505 Busse Highway, Park Ridge, Ill., 60068. Ask for Data Security Cassette No. 5 from the DPMA 1975 International Data Processing Conference. Ed.

Readers Have Wrong Man

A report on a National Computer Conference (NCC) panel session entitled "Programming – Art, Science or Engineering?" [CW, June 4] erroneously attributed to me allegations that the New York Times Information Bank Project was a "disaster."

A correction [CW, July 16] stated rightly that Ed Yourdon, another panelist, in fact made these allegations. Since I have no first-hand knowledge of the Times Project, I am not in a position either to defend or refute Yourdon's claims.

Despite the correction, *Computerworld* continues to receive letters on this subject, and I as well.

I hope readers, now knowing who said which about what, will send their inquiries and angry letters to Ed Yourdon and permit me to fade back into anonymity.

Peter J. Denning

West Lafayette, Ind.

Two Important Lessons

Gerald L. Bortle [CW, Oct. 1] indicated his technical or professional knowledge as a DP manager did not improve as a result of the article, "Users Who Ended Contract Say Honeywell Tried to Take Specs" [Sept. 10]. He should either be complimented or criticized.

The article carried an important lesson which should be of interest to any DP manager who plays a role in the purchase of new equipment: Don't make assumptions regarding documentation – specify what is required in the purchase contract.

The article also carried an important lesson to any computer system purchaser who did not specify documentation: Run, don't walk, to your friendly system supplier (while he is still friendly) and obtain a definitive statement, in writing, about what documentation is yours and what is his.

Unfortunately, maintenance considerations are often overlooked when purchasing new equipment since the focus is usually on the problems being solved. Nevertheless, there are many maintenance-related items which should be a part of any purchase contract.

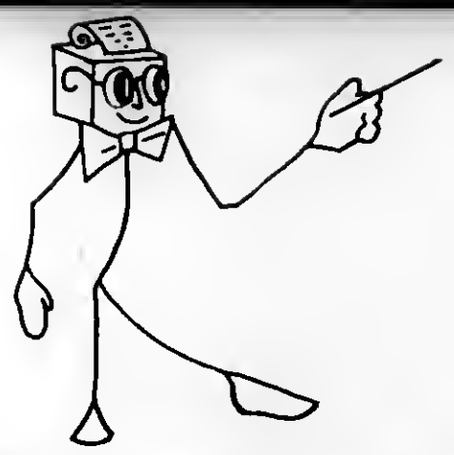
It is much easier to obtain the necessary documentation, or to consider alternative sources, before a contract is signed than to resolve a conflict with a supplier who feels he has already lost a customer.

L.A. Benton

Del Mar, Calif.



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PAT Only Part of Process

Well-Planned Screening Builds Small, Stable Staff

By Don Leavitt
Of the CW Staff

GRAND RAPIDS, Minn. – Blandin Paper Co. has moved through a succession of computers in the past seven years, but the approach it set up in 1968 to build and keep a DP staff has worked well, according to its systems and computer services manager, Doug Englehart.

Grand Rapids is 180 miles north of Minneapolis, 80 miles west of Duluth and even today there is no pool of programming talent looking for work in the town of 7,000 people. So Blandin looked inward and offered all employees the chance to take IBM's Programmer Aptitude Test (PAT).

The company sensed that aptitude measured by PAT shouldn't be the only criteria so, after giving the test to about 200 workers, it screened the top scorers through interviews with their current managers and through talks with the potential programmers themselves.

Past performance, the managers' recommendations and concern for the personalities of the people being screened weighed only slightly less than the PAT socres, Blandin said. In any case, four people were finally selected and all had test scores in the "A" range.

Started With Cobol

Blandin started with the idea of working in Cobol, but the engineering needs of the company indicated a need for Fortran or similar capabilties as well. In order to keep to just one language, training started in Cobol moved to PL/I and, by early 1968, the original crew was at work.

The first computer – a 360/40 – was delivered in the fall and by the end of the year the programmers – three men, one woman – were "reasonably proficient," in Englehart's view. Training was partly through courses at IBM "ed centers" but primarily in-house, with programmed-instruction manuals.

The early work was largely accounting or business-type applications. General accounting, cost accounting, general ledger, payroll "and the usual things" were installed, he said. But so were some more esoteric projects, such as timberlands and forest inventory control.

The operation grew and equipment changed from the Model 40 to an IBM 370/135 and then "back down" to a 370/125 as the installation gained a better understanding of what it had to do.

Meanwhile, the crew grew by another three, with just about a year separating each addition. The newer people were also selected through the PAT/interview-screening process, Englehart noted.

The move to the 125 had two purposes, he went on. It reduced the monthly rental charges and, at the same time, allowed the use of faster peripherals.

The rental cut was matched by a change from a 600 line/min printer to one capable of 1,100 line/min and the implementation of IBM 3340 disk modules. The 160K system operates under DOS/VS, the manager added.

Englehart recognizes "there's always a need for ongoing training," but the size of the present crew and its remote location has led to one basic thought: No matter how good a course may sound, Blandin will never send out the whole staff at one time.

Instead, Englehart encourages each of the staff to pursue his own particular interests and, if a course is available that clearly fits a need, the appropriate person is sent. Once he's back on-site, however, he must assist in training the others in the material he learned while away.

Use of the masculine pronoun in describing the current staff members is correct, Englehart said. The woman who was part of the original crew has been shifted out of programming and systems per se and into the new position of coordinator of outside services.

Moving Up

Another of the Blandin DP pioneers also left the programming scene – to become manager of computer operations. He and one of his operators ("a technical type," according to Englehart) are responsible for maintaining the operating system so they still work closely with Englehart's systems and programming staff.

The staff has considered the possibilities of such "hot buttons" as data base management systems, but Englehart feels that "even before those things become popular we did a pretty good job of integrating things."

One project his crew is involved in currently is linking a System/7 on the factory floor to the 370/125 for data gathering rather than any attempt at direct process control.

Peopleware

Network Study Results Listed

GREENWICH, Conn. – A series of benchmarks run on a number of remote-computing networks were designed to provide insight into the pricing methods and billing algorithms of the networks, according to Real Decisions Corp. (RDC), publisher of an 80-page report of the test results.

The researcher would not release specific details of its findings, but noted five different programs were utilized – one each in Fortran and Cobol and three in Basic. Three of these were run three different ways to increase core, CPU usage or I/O requirements.

The objective, RDC claimed, was to force each system to perform each program "in a simple straightforward manner" and added that "many vendors offer optimized versions of the languages utilized in these tests."

The RDC goal was to compare effects of different pricing structures on common resource utilizations, not to optimize a particular program, the company contended.

Runs were of "fairly small duration" and a technique was devised to simulate low, medium and high usage of connect times and storage utilization. These synthetic figures were used in various combinations and added to actual CPU charges for each program, the evaluator said.

This process produced total cost figures "which can be utilized to more accurately project vendors' price performance results to user characteristics," the researcher asserted.

Within the report, detailed results are provided for all runs made on each vendor. Several graphs are also included which compare results across vendor lines.

The report is available for $600 from RDC, 270 Greenwich Ave., 06830.

Program Utilizes IBM 3270 CRT For Hexadecimal Calculations

SACRAMENTO, Calif. – The Hexcalc routine from Software Module Marketing (SMM) is designed to provide programmers working on IBM 3270 CRT terminals in CICS environments with the means of doing hexadecimal conversions "for the price of a hand-held calculator," according to the vendor.

The $395 package supports conversions from "hex" to decimal, and from decimal to "hex" notation. It also supports both decimal and arithmetic operations so displacements and other forms of relative addressing can be determined, SMM said.

The arithmetic operations are enhanced through the availability of a built-in "constant" facility if the programmer wishes to utilize it, the vendor said.

The CRT comes into play more directly as a replacement for hard-copy printouts with Hexcalc's ability to display portions of core, including paging activity for VS installations, and to display the various tables that are critical to CICS operations.

Working with hexadecimal notation is often time-consuming and subject to errors for programmers raised in a decimal environment. Hexcalc allows the intermixing of "hex," decimal, constant and table equations to simplify the basic conversion processes, SMM noted.

The routine works under DOS, OS and VS versions of CICS on IBM 360s or 370s and can be ordered directly from the vendor at the Crocker Bank building Penthouse, 1007 Seventh St., 95814.

Low-Cost 'Dream' Eyes Systems

AKRON, Ohio – The Dream software monitor now available from The Software Factory is described as a highly efficient and versatile system performance tool geared to the tuning of IBM 360/370 OS or OS/VS systems.

Stressing low overhead – "typically 0.5% to 3.5%," the vendor claimed – Dream provides both detailed and summary information about the system under test. System waits due to enqueued resources; specific device activity, including the percentage of control unit busy, data transfer and tape error information; and SVS usage are among the information reported.

Data on resident and non-resident module usage is also part of the Dream output, as are reports of I/O interrupts including interrupts satisfying user-specified CSW status bytes.

One of the most useful Dream reports, according to the vendor, is one giving detailed data set activity resolved to the cylinder level. Data set names for the associated activity are explicitly displayed, the vendor noted.

Written in Assembler and admittedly less powerful than some other measurement tools, Dream is also considerably less expensive than others, having a one-time cost of only $5,000.

The Software Factory can be reached through P.O. Box 1118, 44309.

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Retrieval Package Simplifies IMS Use at University

By John Jarrard
Special to Computerworld

KNOXVILLE, Tenn. – After extensive evaluation of five data base management systems (DBMS) last spring, the University of Tennessee Data Center here bought IBM's IMS.

Our reasons for going with the DBMS were the usual ones: we wanted to eliminate redundancy of data, to consolidate diverse data elements and to provide direct data access to users. But more importantly, the DBMS would allow us an organized growth potential to handle more data for more users and to go with teleprocessing in the future.

Even though we feel IMS is the best DBMS for us, we would be far less satisfied if we hadn't mated the system with Easytrieve, an information retrieval software package from Pansophic Systems.

We have used Easytrieve under OS and DOS for some time to supply several hundred users with reports they need at a fast turnaround. It seemed a natural decision to buy the IMS interface to Easytrieve when we decided to go with IMS and, in fact, 60 days after IMS was installed, we linked the Easytrieve/IMS Option.

Our data center is the hub of five remote job entry (RJE) sites, all campuses in the university system. Information and report requests are fed in from Chattanooga, Memphis, Martin and Nashville via Data 100s and are processed here on an IBM 360/65 with IMS under OS.

Using Eastrieve with IMS-stored information is much like using the system with our standard files – the actual functions are the same. The big plus is that we are able to get information from IMS quickly and in the format we want.

We are able to use the Easytrieve Macro Processor to produce routine reports with single commands or, if the report is to be customized for each RJE site, we run the specific location part of the input and include the basic report with a macro command. Easytrieve reports are pretty fast to write even if one has to write out the whole report, but the system macros make the job even faster.

Speeds Program Development

One extensive use for Easytrieve is to speed the development of our Cobol programs. We did it before IMS and now we do it with IMS. We can load data into IMS, use Easytrieve as a utility to extract the data with which we want to work, do our debugging with that test data and then proceed to the completed program.

Using the Easytrieve utility for test data and debugging gets us to that final program faster, which increases our production program productivity.

It was our plan from the beginning of our IMS relationship to allow ourselves time to get used to the DBMS. We knew the new concepts and capabilities would take some familiarization. The university workload is much lighter during the summer and we took that opportunity to work with IMS.

Now that the school year has reconvened, the flow of information requests has begun to increase. We have 20 procedure libraries set up at this time for initial IMS work. Of course, this is just a start for us; we won't be servicing all of our users with IMS for some time. But now we know how long it will take.

I also know that, if we weren't using Easytrieve with the IMS-stored data, we would be in for at least double the work to get information out of the data base. The IMS interface took about 30 minutes to learn at the beginning and it's saved its cost many times over already.

Although we are still somewhat new to IMS, we are looking toward a planned growth capability with the DBMS and staying on top of the entire workload, as we have in the past, with Easytrieve.

Jarrard is a systems analyst at the University of Tennessee Data Center in Knoxville.

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The Software Manufacturer

Modified Supervisor Cuts S/3 Disk Need

CANOGA PARK, Calif. – A software package developed by the Group/3 Division of Informatics, Inc., Elimn8, modifies IBM's control software to eliminate the need for an additional disk drive on the IBM System/3 Model 10 for users working with IBM 5445 drives.

IBM software calls for users of the 5445 drive to also rent a 5444 drive, Group/3 explained. Elimn8, which resides on the 5445 drive, "precludes this requirement," according to an Informatics spokeswoman.

Use of the independent's supervisor modifications is transparent to the user, requiring no changes in the OCL parameters.

In addition to voiding the need for a 5444 drive, the package is said to support four basic functions: it copies a 5444 pack to the first 5445 drive (D1); removes a 5444 pack from D1; copies a 5444 pack to a 5445 file; and copies a 5445 file to a 5444 pack.

Monthly rental of the Group/3 Elimn8 package is $99, which the vendor was quick to compare with "about $300" being charged for an IBM 5444 drive.

The software may be purchased for $2,000.

Group/3 is at 21050 Vanowen St., 91304.

'Infomacs' Adapted To Support OS User

VALLEY FORGE, Pa. – Infomacs, the report generator and file-stripper and reformat package from Management and Computer Services, Inc. (Macs), is now available under IBM's OS as well as under DOS, the vendor has announced.

At the same time, the DOS version has been extended to support all IBM disk devices including 3330s and 3340s, Macs added.

As a report generator, Infomacs is designed to produce customized printouts through sets of parameter cards. The basic logic can also be used to select records from existing files, based on user-defined criteria, to create "live" test files.

Built as a load-and-go processor, Infomacs eliminates compile time, which tends to get one-time reports done more quickly than if they had to go through conventional programming operations.

Infomacs is available now – for either DOS or OS installations – for $2,800. Macs is at 790 Valley Forge Plaza, 19482.

Structured Program Guidelines Found in ACM Effort

By Daniel Couger
Special to Computerworld

The editors of *Computing Surveys* set out last year to pull together a series of articles from experts to establish definitive rules for structured programming. Ultimately, the guest editor selected for that issue, Peter Denning, came to the conclusion there are no such rules. Nevertheless, the special issue of the Association for Computing Machinery's (ACM) publication – with five papers on the subject – is outstanding.

Concepts and Techniques

Reviewing issues raised by the authors, Denning said "there are guidelines and good ones at that; but the indivldual programmer's style (or lack of it), his clarity of thought (or lack of it), his creativity (or lack of it) will all contribute significantly to the outcome.

"One of the first viewpoints one encounters in discussions of better programming" he noted, "focuses on the environment in which programmers work. This viewpoint is characterized by the assertion that if only project supervisors would get their programming staffs to follow straightforward practices of good management – especially in regard to project organization and documentation – the main part of the programming problem would vanish.

"The first two papers of this issue address this view. The paper by P.J. Brown is a short, light and pleasant essay describing two sterotypical programmers.

"The paper by J.M. Yohe, cast more seriously, systematically outlines some commonsense management practices which ought to be followed in every programming shop. However obvious the points made by Yohe might seem, the fact remains a surprising number of programming shops fail to follow simple rules, and this failure suffices to flaw their endeavors."

Second Viewpoint

"A second viewpoint is concerned with the structure of the product itself – the program. At this point the term structured programming finds its way into the discussion," Denning noted, "[including] two of the most popularized ideas of structured programming, the use of restricted control structures and the use of top-down programming.

"The paper by Niklaus Wirth presents some interesting examples of these two sets of ideas," the editor said, "and suggests that (in the author's experience) one can almost always find another way of solving a problem in which only the restricted control structures are used, while the efficiency of the resulting algorithm is left unimpaired.

"Those interested in the relationship between using the restricted control structures and not using the persecuted GOTO statement will find considerable material to digest in Donald Knuth's paper. He carefully presents all the known viewpoints both for and against the GOTO statement and, in the process, gives many excellent suggestions on programming.

"He shows that the so-called GOTO controversy has served its role in awakening our attention to the influence a program's structure can have on understanding the program itself and proving it correct. And he has convinced me, at least, that we should lay this controversy aside and concentrate our energies directly on the issues which gave it birth: the principles of good programming.

"A third viewpoint on programming mingles elements of each of the two preceding philosophies. It concentrates on programming style as the key question. From this viewpoint good documentation and project organization [and] good use of simple control structures and hierarchical modularity [are] necessary and important.

"The paper by Brian Kernighan and P.J. Plauger exemplifies this view. The present work is related to their book, which I also recommend to all programmers.

"You will find in their paper examples of programs which look like structured programs but, on closer inspection, prove obscure or even to contain bugs. You will find examples of programs which look unstructured (containing, for example, GOTO statements) but which are quite understandable. You will find examples of programs which look well-indented and properly commented but which, on closer inspection, prove to be unnecessarily complex by an order of magnitude."

Central Idea Missing

During the process of selecting papers for one special issue, Denning reviewed "many papers purporting to show by example how the so-called rules of structured programming operate.

"A common mode of exposition was: Consider versions A and B of the program; B was constructed using structured programming, A was not.

"To the eye of the casual observer and the trained referee alike, both versions were equally obscure. Somehow authors did not bring out the crucial central idea: namely, that one is always working with abstractions."

Denning asserted it is not sufficient to present the end product and expect the beholder to perceive its structure by inspection or "even by deep meditation."

Denning believes "good programming style is not automatically introduced by the rules of structured programming, any more than good English prose style is guaranteed by following the rules listed by Strunk and White in *The Elements of Style*, even though these rules can go a long way toward influencing programmers or writers toward a sense of good style."

Couger is professor of computer and management science at the University of Colorado.

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Pacific Telephone Plans Packet-Switched Service

By Ronald A. Frank
Of the CW Staff

LOS ANGELES – Pacific Telephone and Telegraph will provide a packet-switched communications service for the California state college system beginning in April.

The packet-switched network is being provided as a turnkey system including hardware and software and will link 19 California colleges in all areas of the state. The hub of the packet network will be here at the chancellor's office of the state university and college system.

Traffic on the net will include student computation in engineering, business administration, science and other curriculums, according to a spokesman for Pacific Telephone. The student applications will be part of a time-sharing system to be run on the intrastate packet-switched network.

Additional Terminals

In addition, each of the campuses connected to the network will have at least one remote batch terminal for accessing a separate central batch CPU here.

"We are using packet technology," the Bell spokesman said, "to connect asynchronous terminals which we bring in from the nearest node at each campus. We packet the information at the nearest network switch and carry the data through the network in a packet configuration," he said.

For the time-share traffic, a serial high-speed bit stream will be delivered to the mainframe at the chancellor's office where the message will be demultiplexed within the host software.

This feature will lower costs of the system by cutting down on the number of lines, data sets and mainframe ports, the Pacific Telephone spokesman said.

Tran Building Hardware

Hardware for the network nodes at the college campuses is being built for Bell by Computer Transmission Corp. (Tran). Initially each campus will have a time-division multiplexer (TDM) and minicomputers equipped for both circuit and packet-switching.

The terminals used for the time-sharing application will be interactive teleprinters, while the remote batch terminals will have the capabilities of a 360/30 workstation.

The time-sharing traffic will have network priority over the batch traffic so when time-share volume is high, transmission speeds for the batch traffic will drop. But when time-share messages drop off, batch speed will pick up to the maximum allowed by the modems.

This dynamic resource-sharing capability will be built into the network, the spokesman said. Maximum transmission speed in the network will be 3,600 bit/sec. Data sets will be supplied by AT&T.

Pacific Telephone will purchase the Tran equipment and will then install and maintain it just as though it were Bell hardware.

Although the first customer is the state university system, the network is being built for the California Department of General Services.

Depending on the traffic characteristics and available resources on this first packet-switched network, it may be possible to share resources with other state agencies. There are currently about 19 separate data nets being operated for the state agencies, he said.

The second packet-switched customer for Pacific Telephone will be the Department of Transportation. But in this network, the demultiplexing will be handled by the Bell network switch and will then be transmitted in conventional format to the mainframe CPU.

For Synchronous Data

EDS Has 50,000 Bit/Sec Multiplexer

IRVINE, Calif. – A multiplexer that allows reception and transmission of synchronous data at speeds up to 50,000 bit/sec has been developed by Educational Data Systems (EDS).

Designated the EDS-302, the synchronous multiplexer is an add-on card for the company's EDS-8 programmable data channel multiplexer for Data General Corp. Nova minicomputers. The EDS-302 port card expands the capability of the EDS-8 to include eight synchronous channels in addition to as many as 120 asynchronous channels.

The EDS-302 synchronous channels can each receive and transmit data at any rate (up to 50,000 bit/sec) selected by a system modem. The EDS-8 is compatible with the Advanced Data Communications Control Procedure (ADCCP) as well as Synchronous Data Link Control (SDLC) and Higher-Level Data Link Control (HDLC) protocols, the firm said.

The flag sequence, zero-bit insertion and extraction and the frame-check sequence are all implemented in hardware. The EDS-8, including the EDS-302, permits each channel to operate in an automatic buffer mode for operation through the CPU's DMA channel.

Buffer Mode

In automatic buffer mode, character strings are transferred via the data channel into or out of buffer areas in core memory. The size and location of the buffers is under software control. Thus, entire message frames can be transmitted or received without any interruption of the computer program, the company said.

The EDS-302 hardware also generates and checks the Cyclic Redundance Check (CRC) code.

All data and control lines operate in accordance with EIA Specification RS-232C, in either full- or half-duplex modes. There are three outgoing data set control lines (Request to Send, Data Terminal Ready and Secondary Request to Send) under program control.

The EDS-302 makes available to the programmer five incoming data set control lines (Clear to Send, Data Set Ready, Ring Indicator, Received Line Signal Detector and Secondary Received Line Signal Detector).

With the EDS-302 card, users can obtain up to 128 multiplex channels combining both synchronous and asynchronous communications. The cost of the card with eight synchronous channels is $3,600. A two-channel version is $1,200.

The total cost of a complete EDS-8 multiplexer system including eight asynchronous channels, two synchronous channels, all necessary cables, connectors and junction panels as well as power supply, is $4,430. Delivery is 30 days from 17981 Sky Park Circle, 92707.

Bell to Offer Packet-Switching?

NEW YORK – The Bell System was recently reported to be considering the introduction of an interstate packet-switched service for data communications users.

An AT&T spokesman said he knew of no specific plans to inaugurate such a service, but added packet-switching technology is certainly one of the areas being considered along with others.

Bell Laboratories reportedly is analyzing the potentials of a packet-switched offering by the Bell System telephone companies.

While there are no technical drawbacks to introducing a packet-switched service onto the phone system, AT&T is evaluating whether it is willing to allocate the manpower to such a project on a nationwide scale, according to one industry source.

A Bell packet-switched network would not replace the present Dataphone Digital Service (DDS), but would provide a second alternative for data users, the expert said.

IBM Introduces 3777

WHITE PLAINS, N.Y. – IBM has added a remote-job-entry (RJE) terminal to the 3700 family that includes a 1,000 line/min printer. Called the 3777, the terminal is the first in the line to use the 3203 printer.

The 3777 includes a keyboard/card reader console that incorporates a higher speed model of the 2502 card reader operating at 400 card/min. Other readers are available.

The faster printer is a separate unit attached to the console by a cable. It can operate at 1,000 line/min using a 48-character print set or it can operate at 870 line/min with a 60-character print set, IBM said.

The 3777 can transmit data to an IBM 370 at speeds up to 9,600 bit/sec using IBM's Synchronous Data Link Control, the firm said. The unit can also operate with a 360 using 2770/3780 binary synchronous communications (BSC) at speeds up to 9,600 bit/sec.

An optional SDLC/BSC switch control is available for users with both types of lines and costs $27/mo on the 24-month Extended Term Plan (ETP) or $32/mo on monthly rental. Purchase of the switch feature is $1,080.

A typical 3777 including BSC, 9,600 bit/sec driver, EIA interface and 2502 card-reader attachment with the 400 card/min capability and printer costs $1,565/mo on ETP, $1,790/mo on monthly rental or $60,670 purchase.

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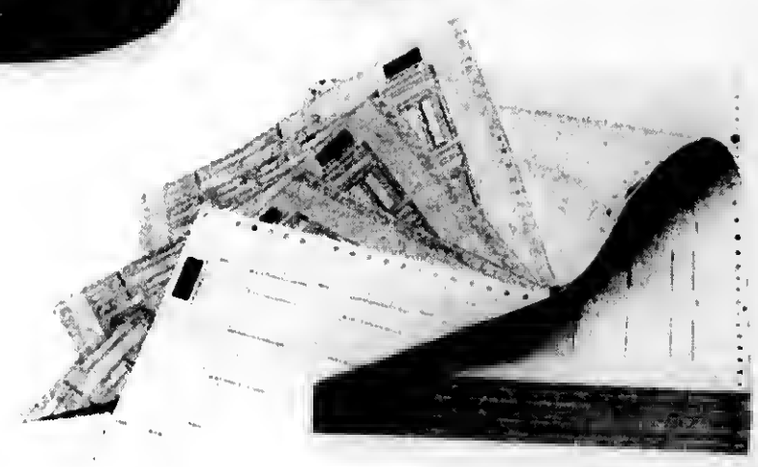
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847 848	5440 —	5444 —	9425 9427	100 200	2200 2200	2.5 5.0
849 851	1316 —	2311 —	23111 854	100	1100	7.25
869 871	2316 —	2314 —	23141 841	100	2200	29.2
873	—	—	23142	200	2200	60.0
876 storage module	—	—	9760	200	6060	40.0
877	—	—	9762	400	6060	80.0
879 881	3336 —	3330 —	33301 844	200	4040	100.0
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CONTROL DATA CORPORATION

Disk Operates as Terminal Peripheral

SANTA ANA, Calif. – Serial RS-232 read-only memory (ROM) programs are available for operating the Applied Data Communications Series 62 intelligent floppy disk as a terminal page storage system or as an on-line disk storage system.

As a terminal page storage memory system, nonintelligent or intelligent terminals can now have .25M bytes of random-access storage available in a page memory address mode with Model 62-130-161.

Data is entered asynchronously by character, or a full page of screen image characters may be transferred in a batch mode.

For on-line applications, the intelligent floppy disk responds to a command of start code, function, drive number, track number, sector number and stop code.

Data is transferred in 128-byte records. The host device determines the function – read, write or status request – and where on the disk the data is to be accessed.

The disk is described as IBM-compatible with 77 tracks and 26 sectors of 128 bytes each. Average access time is less than .5 sec to any sector or page.

The on-line RS-232 program accommodates up to eight disk drives by specific address, while the terminal-oriented program accommodates up to eight disk drives by added page numbers.

Page capacities are customer-selectable in multiples of 128 characters. Popular sizes are 1,920 characters (15 sectors), 3,328 characters (26 sectors) and 1,644 characters (13 sectors).

Price for the Model 62-130-161 is $4,250 complete. A dual drive system Model 62-132-161 is $5,450 from 1509 East McFadden Ave., 92705.

Receive-Only Model

Extel Has 30 Char./Sec Printer

NORTHBROOK, Ill. – Extel Corp. has introduced the Model AH-11-R 30 char./sec receive-only teleprinter with standard features that include type variations that can be selected on-line and built-in diagnostics that allow on-site determination of operating condition.

The terminal is controlled by a microprocessor and operates at a low sound level, Extel said.

Printing of an original plus two copies is provided with a choice of standard teleprinter paper with ribbon or with coated (ink-encapsulated) paper – either available in 8-1/2-in. width.

The printer offers upper- and lower-case, expanded and bold-face and underlining. Continuous short-line printing is accomplished without the need for fill characters.

Options include built-in modems of Bell 103-, 108- and 113-type; selective calling for the most widely used 5/6/8 level codes; a 20-character answer back; page formatting for document filing; and special-character sets, including lower-case type with descenders.

The terminal costs $1,480 and is also available on various lease plans from Extel at 310 Anthony Trail, 60062.

Lear Siegler Releases 'Bare-Bones' CRT

ANAHEIM, Calif. – Lear Siegler, Inc. has introduced a 12-in. "bare-bones" video terminal, the ADM-3LC.

The terminal offers a standard 960-character display in 12 lines or 80 upper and lower case characters. It also has an optional 24-line, 1,960-character display.

In applications now using teletypewriters, the ADM-3LC is said to be software- and hardware-compatible and can be used for direct replacement of the teletypewriter, the firm said.

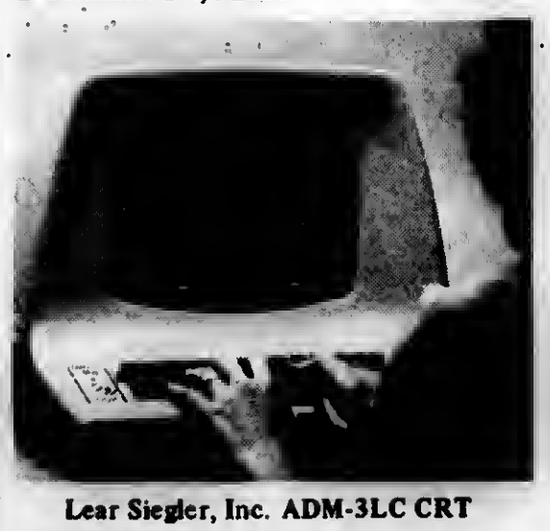
The standard 59-key office-type keyboard, with upper and lower case shift, permits generation of the complete Ascii set. The ADM-3LC displays upper and lower case in high-contrast characters in a standard 5 by 7 dot matrix.

Data entry is at the bottom line of the ADM-3LC screen. Advancing to a new line causes the entire data page to scroll upward, typewriter-style.

End-of-line is announced by an audible tone to alert the operator to go to the next line manually, Lear Siegler noted.

A switch panel next to the keyboard allows operator selection of the ADM-3LC operating mode, either full- or half-duplex. The transmit and receive speed is selectable from 75 bit/sec to 19.2 kbit/sec, the company said.

The ADM-3LC terminal sells for $1,095 and the optional 24-line display costs $250, the firm added from 714 North Brookhurst St., 92803.



Lear Siegler, Inc. ADM-3LC CRT

Diablo Adds Signals For Hytype II Units

HAYWARD, Calif. – Diablo Systems, Inc. has added optional "paper-out" and "ribbon-out" signals for its Hytype II serial printers.

The paper out signal can be programmed to either stop the printer or to notify the operator in time to resupply the unit before it runs out of paper, a Diablo spokesman said.

The ribbon-out feature signals when the unit is about to run out of ribbon. The signal can be used to either stop the printer or notify the operator.

The paper-out option costs $26, and the ribbon-out option $18 from the firm at 24500 Industrial Blvd., 94545.

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370/145 memory

Canadian Certification Program Allows Direct Connection to Nets

By Gordon D. Hutchison
Special to Computerworld

OTTAWA – Government industry cooperation has led to the formal introduction of a program to permit the direct connection of customer-owned telecommunications terminal equipment to the networks of federally regulated carriers in Canada.

The government has introduced a certification standard and released the details of the certification procedure for a limited range of nonnetwork-addressing devices. The program will go into effect Nov. 21.

Procedures for other types of terminal devices will be introduced after this initial liberalization of interconnection restrictions has been tested and the procedural bugs worked out.

A type-approval program has been designed, in which manufacturers, distributors and other suppliers submit their equipment for test and certification by the Department of Communications. Thereafter, persons or organizations owning the type of equipment certified can connect the equipment to the network without a telephone company-supplied coupler.

Couplers will still be required for unapproved hardware, and the restrictions against customer-owned equipment of the network-addressing type will continue to be in force.

Under the terms of the program four basic types of nonnetwork-addressing equipment can be type-approved for direct electrical or acoustical connection to the networks of federally regulated telephone companies.

The equipment so far includes mostly voice telephone equipment.

Although there are limited applications for DP purposes within the range of approved equipment, the groundwork has been laid for type-approval of more sophisticated terminal hardware, an industry source said.

Federally regulated telephone companies are Bell Canada, British Columbia Telephone Co. and Canadian National Telecommunications, which represent about 80% of all telephones installed in Canada.

Micro-Controlled CRT Has Plug-In Boards

OTTAWA – A data communications terminal from The Computer Communications Group of the Trans-Canada Telephone System is a microprocessor-controlled CRT unit featuring plug-in modular circuit boards which allow features to be added right at a customer's premises.

Vucom 3 can operate in a communications or in-house environment by means of switched or private lines. It is said to be compatible with Vucom 1 and, in addition, adds polling and buffering options for those users who have functional requirements beyond Vucom 1, but do not need the level of intelligence associated with Vucom 2, a spokesman said.

The basic unit displays 960 characters in 12 lines of 80 characters. The display expansion option provides a maximum of 1,920 characters in 24 by 80 format.

Vucom operates at switch-selectable speeds from 110 bit/sec to 9,600 bit/sec. To further expand the terminal's storage capability, a magnetic tape cassette recorder is available. Each cassette has a 50,000-character storage capacity.

The basic terminal will be rented at a monthly rate of $115 to $125, depending on geographic area served. Two-year contracts will be available.

Vucom 3 is also the first terminal the firm has offered for outright sale to customers. The basic sale price will range from $2,600 to $2,800.

Vucom 3 is supplied to the company by Control Data Canada Ltd.

Line Problems Explained

BURLINGTON, Mass. – A brochure from Intertel dispels some of the mystery surrounding the telephone line failures that can plague high-speed networks.

Of interest to 4,800 bit/sec and 9,600 bit/sec data network users, the brochure shows oscilloscope photos of transmitted data with various kinds of line distortion and explains how users can identify typical line degradation problems such as amplitude and delay distortion, harmonic distortion, noise and phase jitter.

The brochure is free from 6 Vine Brook Park, 01803.

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Mass Storage's Slow Acceptance — Part 1

Advances in Other DP Areas Explain Scant Interest

By David N. Freeman
Special to Computerworld

Some of the most prominent DP manufacturers, such as IBM, Control Data Corp. and Ampex in the past decade developed mass storage systems (MSS) capable of keeping approximately one trillion bits of data on-line.

But during this time, commercial users generally showed scant interest in MSS. There are several reasons for this lack of interest.

One was that disk drives were announced as fast as most installations could assimilate them.

Within the decade, IBM moved from its 2311 drive (7.25M bytes) to its 2314 (30M bytes), 3330 (100M bytes), 3330-11 (200M bytes) and — just recently — 3350 (317M bytes).

Other manufacturers have matched IBM in this respect, leading to an annual unit-cost decrease of 15% during the decade.

Another reason was that technology has kept magnetic tape competitive with disks for archiving and sequential-processing functions.

Tape densities have increased from 800 bit/in. to 1,600 bit/in. to 6,250 bit/in.

Although not so dramatic as disk capacity increases, this has served to maintain tape's supremacy for archival purposes.

With the rapid increase in the number of disk packs per installation, tape has become the standard media for backing up disk.

The unit purchase price for tape reels has remained in the $12 to $20 range, whereas disk packs have typically rented for $15 to $25 per month.

Another factor was that the need for a third level in the storage hierarchy was uncertain. Many of the largest on-line applications — airline reservation systems, savings bank depositor inquiries and military-type command and control support — require random-access response times of 3 to 5 seconds.

None of the MSS devices developed during the last decade has been able to meet this performance level when accessed by dozens of terminals.

Even today, no announced MSS device can store 10 billion bytes on-line with the capability of retrieving any 100-byte record at random in less than 5 seconds.

The only approach furnishing this capability has been a room full of disk drives, logically organized so active subfiles are located on different drives.

Although this approach is very costly in terms of hardware (often exceeding $50,000/mo rentals) and floor space, it has the advantages of substantial redundancy in all critical components — channels, control units, devices, power sources and human operators.

It also offers commonality with peripheral equipment for other functions, since the control program and most batch applications use the same type of disk drives for secondary storage.

In short, management of large numbers of disk drives has become a routine operational need and — at most installations — has been addressed by installing 20, 50 or more spindles of a single standardized architecture.

The trend toward distributed data bases is another reason users lack interest in MSS devices.

Besides the new large-capacity disk drives, the major manufacturers have developed small, inexpensive disks: cartridges containing one or two platters and floppy disks utilizing a plastic record actually touched by recording heads.

The cost of these disks has been brought so low that virtually all new minicomputers — business or scientific — use them for storage of programs and data files.

Unit costs for storing and processing business data on minicomputers like the IBM System/32, Burroughs L9000, NCR 399 and Philips P-350 are quite competitive with processing the same data at corporate computer centers on IBM 370/168s, Burroughs B6700s, etc.

Reliability Unknown

The fact that hardware reliability of MSS devices is unknown — hence worrisome — and adequate file organization support may be years away is another reason users are not very attracted to MSS devices.

IBM delivered a precursor MSS device — the Data Cell — a decade ago which was unsuccessful in many respects.

IBM's competitors brought out functionally similar devices such as RCA's Race file and NCR's Cram file, which were little more successful.

Installation managers now are wondering whether the new MSS generation will experience these same problems of market acceptance and reliability or whether IBM and its competitors have learned how to field-maintain and software-support their MSS entrants.

Freeman is a senior associate at Ketron, Inc. in Wayne, Pa.

Part 2 of this series will outline the type of user installation that could effectively use a mass storage system, describe current mass storage equipment and suggest when an installation might want to convert to mass storage systems.

Workshop Planned

KING OF PRUSSIA, Pa. — The IEEE Computer Society's Second Mass Storage Workshop has been scheduled for Jan. 27-28 at the Sheraton-Valley Forge Hotel here.

Format of the workshop includes a plenary session on the first morning, round-table discussions that afternoon, progress reports by mass storage system manufacturers and users in the evening and additional round-table discussions the following morning.

Focus of the workshop will be on software support and maintenance of forthcoming mass storage systems, how to migrate to mass storage from tape/disk systems, reliability and back-up procedures, media standards and how to share mass storage among several mainframes.

Further information is available from Chairman David N. Freeman at 530 E. Swedesford Road, Wayne, Pa. 19087.

Lundy Micr Bank Data System Provides Variety of Sort Patterns

GLEN HEAD, N.Y. — Lundy Electronics & Systems, Inc.'s Micr satellite bank data system is a turnkey product that can provide a variety of sort patterns, totals, subtotals and differences, according to the vendor.

Called the System 970, the product also offers optional communications to a remote mainframe.

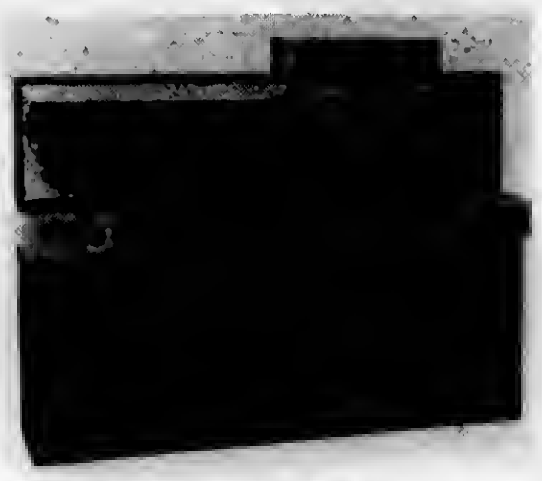
The 970 can perform multimedia processing via key-to-cassette and key-to-tape devices for file maintenance, loan applications, trust department records and reports, Lundy said.

The system also offers accumulation, formatting, report reception and printout and cash letter generation, the company added.

The System 970's reader/sorter processes 750 document/min; its magnetic tape unit produces 7- or 9-track, 800 bit/in. or 7-track, 556 bit/in. output. Its line printer can generate 400 line/min.

CMC-7, OCR-A-1 or OCR-B font recognition are optional, as is a 600 line/min printer, a 1,600 bit/in. tape unit and additional memory for the 8K minicomputer that drives the system.

Standard software includes device drivers for each peripheral; Micr sort modules that control pocket selection on the reader/sorter; application modules to format data and generate totals; and communications modules that link the system with various CPUs.



Lundy System 970 Reader/Sorter

Lundy is also offering tape-to-print, cash letter generation and keypunch simulation modules and will modify its software to suit a user's needs, the firm indicated.

The System 970 costs $85,000 and leases at $1,725- to $2,200/mo. The firm is located here in Glen Head, 11545.

STC Has 370/158 Add-On Memory

LOUISVILLE, Colo. — Storage Technology Corp.'s (STC) 3758 semiconductor add-on memory for IBM 370/158s offers 4K-byte chip design, maintenance aids and lease plans for users of purchased machines, an STC spokesman said.

Built by National Semiconductor Corp., the memory is designed to boost 370/158 storage in increments 512K to a maximum of 4M bytes.

The 4K-byte chip design offers reduced heat and power consumption and increased reliability compared with 1K-byte memory units, a spokesman said.

Maintenance aids allow the user to monitor bit failures during operation and isolate faulty bits within an address, the spokesman added.

The 512K-byte memory module can be disabled or reassigned within an addressing scheme, the company said.

The memory units sell for $157,200 plus maintenance or lease at $3,500/mo including maintenance from the firm at 2270 S. 88th St., 80027.

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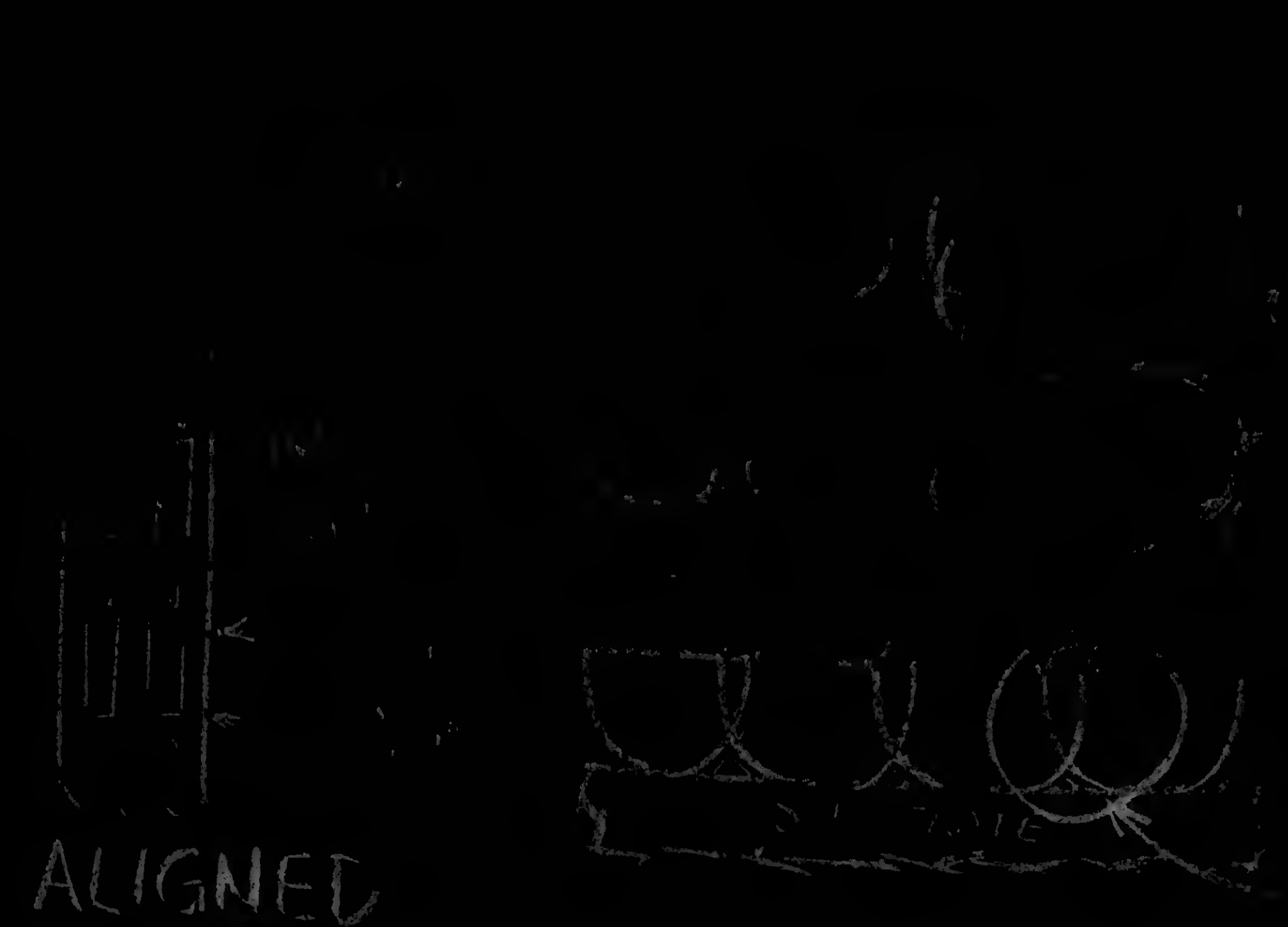
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On-Line Retrieval Solves Parts Problems

CORRY, Pa. – Knowing the latest status update on a single custom-designed part is essential to the operations at McInnes Steel Co., and a computer is giving it that information.

McInnes is a medium-sized plant that specializes in the forging and manufacturing of a variety of parts, including those for nuclear applications, which may require up to 50 weeks for completion.

"An entire multimillion dollar project may be held up waiting for an important component we are manufacturing," said Stephen S. Fogle, DP manager, "but some parts, especially for our nuclear equipment customers, are extremely complex and require tests and operations taking days or weeks.

"We may check at one time and find a part is two weeks behind schedule and then check five minutes later to discover the expediter has updated the status and moved the schedule back onto the correct line," he noted.

For this reason, McInnes' real-time computer input and output system is a must, Fogle said.

The move into computerization was not without its obstacles, Fogle noted.

"Our plant is a compact one, and we had little choice as to where we could set up the computer room: we were forced to place it directly above the forge which shakes the entire building when it's in operation," he said.

"We were quoted $12,000 by one firm to install floating floors that would eliminate the vibration. Fortunately, we hit upon using special shock mounts under the equipment that isolates the computer from the shaking quite well," he said.

The shock mounts cost about $28 each and totaled less than $300 for the whole McInnes computer array. Fogle noted vibration is certainly not affecting the NCR Century 101, as he has had only 18 hours of on-line downtime in two years.

The system is run dedicated on-line from 7:30 a.m. to 5:00 p.m., with some batch processing done by a night operator.

During the day, however, a large number of transactions are carried out as the expediter brings up reports of progress made on individual orders. Also, all new orders, new operations and their maintenance are done during the on-line day.

The information is entered by means of NCR 796-201 CRT video terminals, rated at 4,800 bit/sec. Six are available at the McInnes plant, both for entering data and retrieving it as needed.

Portable Terminals Added

"To eliminate tying up the inside men with the relaying of long, often complicated reports, we have recently added two NCR 260-5 portable terminals, which can be put on-line with the Century 101 by means of an ordinary telephone line.

The salesman effectively has a complete computer tie-in. This allows him to request data which is printed out by the terminal at the rate of 30 char./sec.

"No video referencing is available from the portable terminal, which is contained in a compact, small-suitcase-sized case," Fogle noted.

As soon as the computer has a status change entered, it is available to anyone with access to one of the eight in-house or portable terminals, he emphasized.

McInnes also supplies its customers with regular status report printouts which show clients all of the jobs it currently has at the company, how each is progressing and projected completion date. These reports contain both McInnes and customer reference numbers, salesman's name, price and other data.

McInnes also is using a program that allows the computer to compute standards for machining parts as well as determining which machine is best to do the job, he commented.

"We can supply the computer with information on all the jobs that are available, the specifications and schedule needed," Fogle explained.

"It can take into account the capabilities of each different machine that might be able to handle the jobs – minimum and maximum sizes, speeds, feeds and so forth – and determine which machine we should use for maximum efficiency," he said.

With specifications from McInnes engineers, the computer also determines and prints out the exact standards to be used to produce a piece.

"Because the computer is doing the job, we always calculate standards the same way. Thus, the workman can look at the recommendations and then immediately see that his own individual working style would complete the job faster another way than the one recommended.

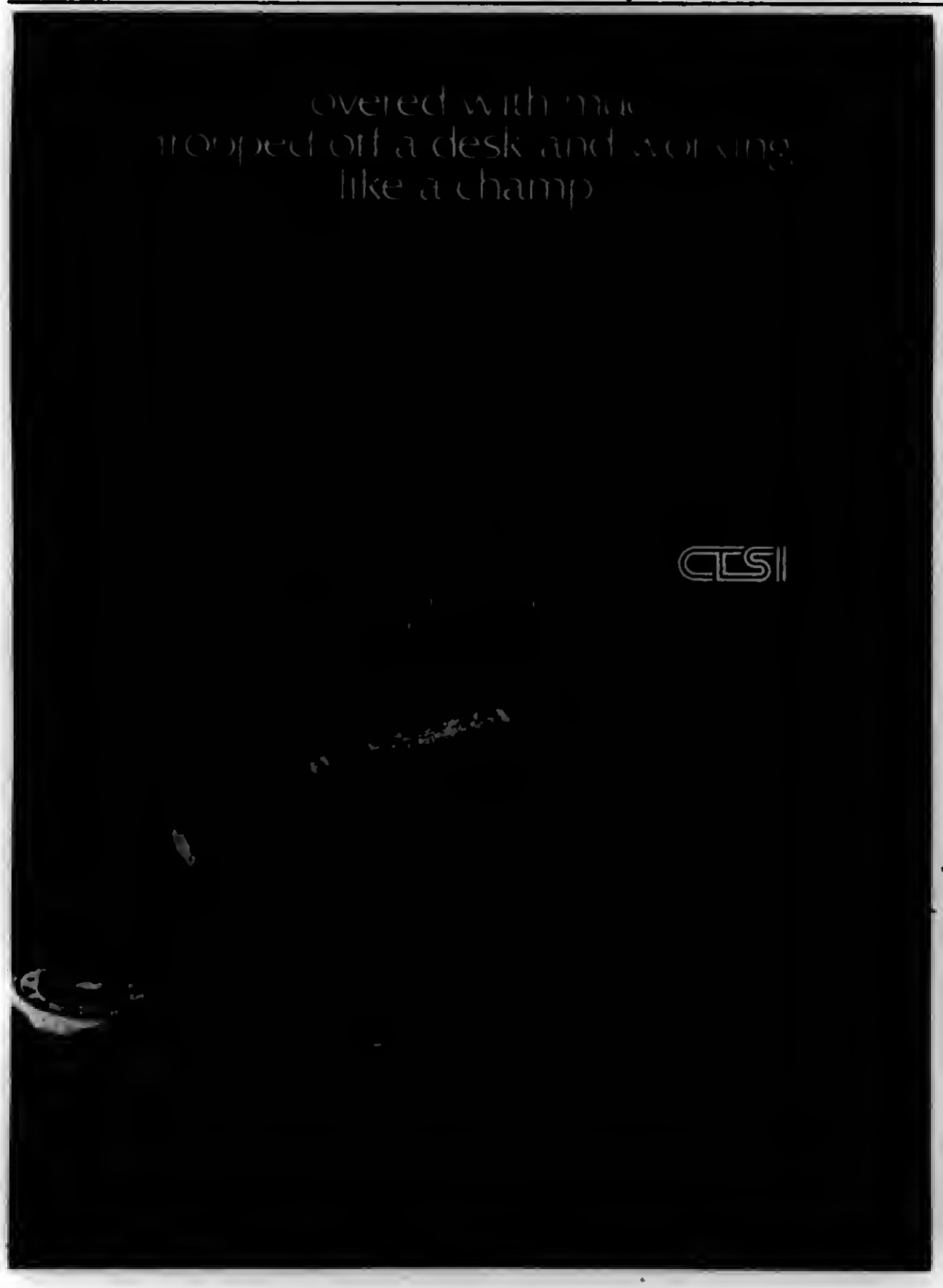
In addition, if we need to switch a job to another machine at the last minute we don't need to recalculate standards – they are available from the computer," Fogle noted.

Though classified as a job shop, 50% of McInnes' workload is in repeat orders. For these, the computer can also be used to recalculate prices, to reflect increased material costs or other factors that have changed.

In the future, Fogle is looking toward using a data base inquiry system with a 128K Century 101.

"This will eliminate a lot of the one-time programs we have to write," he explained. "The president of the company may come down and want to know how many of a certain type of job we did last year. I've either got to give him a whole dump to look through or else write a one-time program to allow us to get that specialized data.

Fogle said he hopes to put the plant's steel inventory on-line in the near future, as well as steel certifications and bills of lading. Still another improvement will be the hooking up of a large-format television monitor to one of the CRT terminals to allow viewing of the larger screen-size computer output in McInnes' conference room.



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Airline Unites Approaches to Simplify Data Entry

ELK GROVE TOWNSHIP, Ill. – A small data entry staff at United Airlines here has managed to convert a number of complex on-line data entry applications to key-to-disk gear.

United has a huge data entry requirement in terms of both volume and complexity of data. Passenger and freight revenue accounting is made particularly complex by the large number of rates and tariffs, special fares, interline ticketing, agent commissions and government regulations.

Until recently, five different types of data entry equipment were used at United – key-to-disk systems, keypunches, typewriters with optical scannable font, Four-Phase Systems, Inc. CRTs on-line to the IBM 360 under Customer Information Control System (CICS), and IBM 2260 CRTs.

United wanted to standardize data entry equipment, but retain the sophisticated editing accomplished with the on-line CRTs. The airline chose 11 Four-Phase System IV/70s with about 120 operator stations using Data IV/70 data entry software provided by Four-Phase.

Data is keyed to disk, then output to magnetic tape. Tapes are transferred manually to the mainframes located in the same building.

Patch Panel

A patch panel allows any operator station to be switched into any of the 11 processors, providing flexibility and backup for the operators. Ten processors are used for production work; the 11th is for backup.

United's data entry department uses some 280 unique multiformat jobs, of which 25 are major.

The jobs include passenger revenue accounting in which data is entered from passenger tickets lifted at the airport, processing air freight waybills and sales accounting of data entered from tickets sold by United or its agents.

Jeff Jerome, United's supervisor of data entry support, led the equipment evaluation and implementation effort. His main criteria were equipment flexibility and sultability to the data entry department and the elimination of costly edit runs.

In addition to cost savings, he had to consider the impact of equipment on a 300-employee department operating three shifts a day. As a result, human engineering aspects of the equipment, ease of application formatting and flexibility were important selection criteria.

Jerome had another requirement. United's revenue accounting system has evolved over 10 years into one allowing the operator extensive judgment at the time of data entry.

The operators are trained to look at a ticket and make a judgment on what data must be entered and in what order.

As a result, United developed a free-form area for input where the operator could enter coded information in any order. These applications previously were handled from the mainframe via on-line CRTs. Jerome didn't want to sacrifice input flexibility.

The Data IV/70 language offered the capability to validate the free-form entries. Free-form data entry yields throughput improvement over a fixed-field approach, where many fields are blank.

"We really haven't had an edit routine that we weren't able to perform with Four-Phase software," Jerome said.

All applications were coded and implemented by Jerome's three-employee staff. As they are located right in the data entry department, changes in formats can be implemented at once, an important consideration in an environment of constantly changing specifications for many applications. Jerome's staff uses the Cobol capabilities of the Four-Phase systems to perform statistical work, eliminating the need to go the DP department for special programs. A Four-Phase Cobol program was written to analyze data entry performance statistics that are produced by Data IV/70.

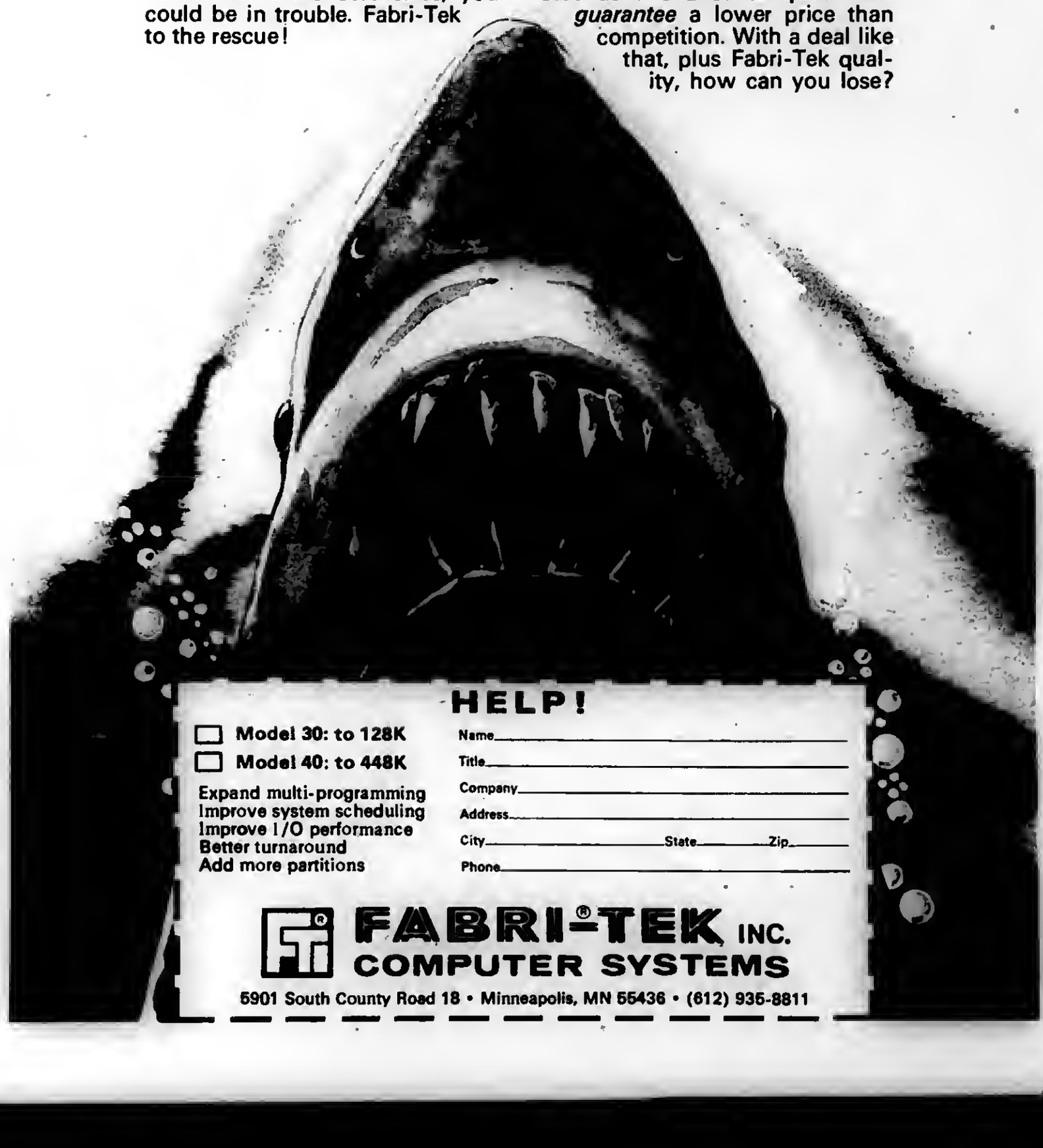
This program prints special reports used by the data entry staff. Jerome is developing an RPG program that will be used to perform quality control on selected batches of data.

Certain batches will be entered twice by separate operators. The RPG program will analyze the batches and flag those that do not match.

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COM Seminar to Mark Caravan Stops in '76

NEWTON, Mass. – A seminar on "COM – Optimizing Computer Output" will be conducted by the Computer Image Processing (CIP) Division of the National Microfilm Association at each Computer Caravan city next year.

CIP's main purpose in joining the Caravan with this free seminar is to "spread the good word" about computer-output microfilm (COM), Frank Hinkle, incoming president of CIP, said. The seminar will address concepts and applications rather than specific equipment.

Following CIP's seminar, individual COM vendors will conduct separate exhibitor seminars. Information in the exhibitor seminars will cover much more than just equipment descriptions, Hinkle said.

"The vendors will stress applications, because that's the type of thing the person who comes to the Computer Caravan is interested in," he said. "They want to know about applications, how to make a COM study, how to justify COM equipment and how to use it."

The Computer Caravan, which is sponsored by Computerworld, Inc., will begin in Boston March 2 and then travel to New York; Washington, D.C.; Atlanta; Detroit; Chicago; Dallas; Los Angeles and San Francisco.

Carrying Bound Printouts Eased With Free Handle

ELIZABETH, N.J. – Boorum & Pease Co. will include a free slip-on/slip-off Datatote handle for 14-7/8-in. unburst DP printouts with orders for 10-packs of the company's N-32-14 series binders.

Made of molded plastic, the handles give briefcase-like carrying ease to bulky binders, the company said.

The 10 binders cost $24. Additional Datatote handles sell for $1.25 each from the firm at 801 Newark Ave., 07208.

Honors Cash, Credit Cards

Mini Manages Self-Service Gas Pumps

ANAHEIM, Calif. – Drivers stopping to "fill 'er up" here are finding their friendly service-station attendant has a new helper – a computer.

That's the case at a number of Arco service stations here, in Los Angeles and on the East Coast.

The Anaheim facility is typical of all the installations – a computer-controlled self-service station opened by Atlantic Richfield this past year. It is an entirely new dimension in convenience operation, providing the maximum in speed and efficiency, a spokesman for the oil company said.

The system, which was designed and manufactured by Docutel Corp. in conjunction with Atlantic Richfield, consists of three terminals, each of which monitors six fuel pumps and has a customer input panel.

Controlled by a Naked Mini minicomputer, manufactured by Computer Automation, Inc. of Irvine, Calif., the system handles all credit card or cash sales, the dispensing of fuel and the printing of a detailed receipt – activities normally accomplished by a station attendant – while providing numerous safeguards for the customer.

What's more, the system also provides a detailed printout of all transactions completed during the day, showing the type and amount of gas pumped. This enables both dealer and distributor to continuously monitor inventory.

Operates With Card, Cash

The system operates with any Atlantic Richfield credit card – or, if a customer is old fashioned, it'll take cash.

When using a credit card, a customer drives in, leaves his car and inserts his card into the control terminal on the pump island. The control panel is connected to the Naked Mini at the station, which in turn is linked by a telephone circuit to Atlantic Richfield's credit card center in Atlanta.

Once activated, the minicomputer performs a verification check to assure that the credit card is valid and that the bills have been paid on time.

The electronic verification procedure ensures only the person to whom the credit card is issued can use it. A list of bad accounts and stolen credit cards is maintained in Arco's credit card center in Atlanta and is checked each time a transaction takes place. If a card matches a number on the list, it is captured by the system.

The process of credit checking takes only a few seconds. Once the account has been verified, the customer pushes a button to select his fuel, grasps the fuel nozzle and pumps his gas. Along the way he is guided by simple instructions displayed through a window on the control panel.

When the transaction is complete, a receipt is issued containing information such as date, time of day, amount of purchase, type of fuel, price per gallon and number of pump.

In addition to credit cards, purchases can be made with cash by simply inserting dollar bills into a slot in the terminal. If $3 is inserted and only $2 worth of gas is pumped, a refund authorization is printed and handed to a human attendant who makes change.

"During initial development, we became involved in a thorough analysis of the system to find a design that would be easily understood and accepted by the public," Bill Fuqua, marketing vice-president for Docutel, said.

Performance demonstrated the public does accept the system, he said. In fact, they seem to enjoy using it, possibly because the average service station attendant requires 10 to 15 minutes to complete a normal transaction, while a cutomer can do it himself in less than 3-1/2 minutes and be on his way, Fuqua added.

This computerized service, coupled with inherent inventory control, not only speeds the flow of traffic through the station, but also lets the station and central distributors know the status of the gasoline supplies on hand and when to reorder.

System Counts Votes

BERKELEY, Calif. – Computer Election Systems (CES) has developed a minicomputer system that will both maintain voter registration files and process ballots.

The system is based upon a Hewlett-Packard (HP) Model 2125 Discomputer.

The system is CES's first venture into computerized voter registration data bases. Previously, the company has marketed three types of vote-counting machines in conjunction with its Votomatic vote-recorder line, presently being used by 15% of the nation's voters, the firm said.

The basic system is priced at under $100,000. It includes the Model 2125 Discomputer with 32K core and 15M byte disk memory, a ballot card reader, printer, and two HP Model 2640 CRT terminals.

French IBM 115, 125 Submodels Introduced; Unavailable in U.S.

PARIS – The IBM System/370 Model 115-2 and Model 125-2 were recently introduced by IBM World Trade Euope/Middle East/Africa.

The expanded models aim at increasing the range of applications into data base/data communications, for example – by boosting processor speed and on-line disk capacity, IBM said.

The announcement includes, for the Model 115-2, a memory of up to 256K bytes, plus a faster multiplexer channel. Both new models have an increased instruction execution rate, the firm said.

The number of attachable IBM 3340 disk storage drives is doubled to eight spindles for the 115-2 and to 16 for the 125-2, and string switching between processors has been introduced.

A cardless system is now available with diskette as primary I/O medium.

French prices for the 115-2 configuration with 64K and the expanded features are 1,011,033 francs ($231,527) compared with 750,332 francs ($171,826) for the earlier 115 with 64K.

The French price of the 125-2 with 96K and the expanded features is 1,448,676 francs ($331,747) compared with 1,245,081 francs ($285,123) for the earlier model with 96K.

In Germany, meanwhile, *Computerwoche* reported monthly rental of the 370/115-2 with 160K of memory comes to 16,000 marks, or approximately $6,250.

First customer shipments are scheduled for April on the 115-2 and February for the 125-2. The systems are not available in the U.S., the Americas or the Far East at this time.

Modcomp Users Forming Group

FORT LAUDERDALE, Fla. – Users of Modular Computer Systems, Inc. (Modcomp) minicomputers are invited to join an independent user's group.

Designated Modcomp Users Exchange (Muse), the group currently being formed will hold its first formal meeting on Dec. 11 and 12 here.

The purpose of the group, according to Kenneth Wiley of Lawrence Berkeley Labs and acting president of Muse, is the promotion of the research and development of ideas and information related to computers and computer science for the benefit of its members and the public.

In addition to Wiley; other officers elected to serve until the first full election at the December meeting were: Pat Hughes of Community Health Computing, vice-president; Linda Deveau of Massachusetts General Hospital, Treasurer; D'Arcy Randall of Standard Oil of Indiana, Secretary; and John Moore of Saint Vincent's Hospital in New York and Bruce Meyer of Cornell University, both elected at-large delegates to the board of directors. Edward Marinaro, head of Modcomp marketing, was selected to represent his company on the board of directors.

For additional information regarding membership, contact Muse International, Modular Computer Systems, Inc., 1650 W. McNab Road, 33309.

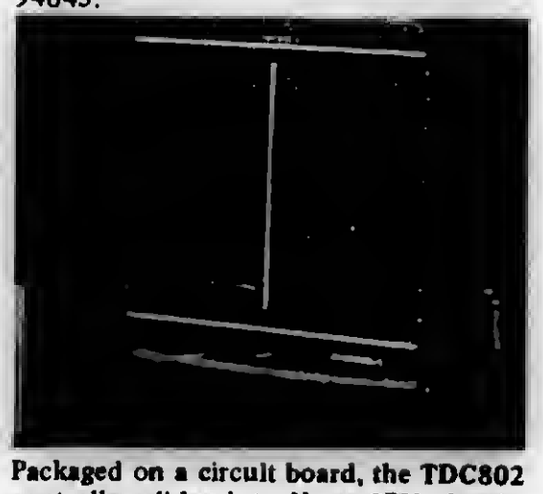
Unit Links Nova, Calcomp Drives

MOUNTAIN VIEW, Calif. – A controller linking California Computer Products, Inc. (Calcomp) Trident disk drives with the Data General Nova and compatible minicomputers has been announced by Minicomputer Technology (MT).

The TDC802 controller is a self-contained interface for all Data General Nova and compatible computers, including the Eclipse, and the CPUs made by Digital Computer Controls (DCC) and Keronix, Inc., MT said. The controller requires one CPU slot and cables directly to up to four Trident drives.

Standard features include DMA data transfer, full-sector buffering, hardware check sum calculation, dual access, automatic bootstrap capability, rotational position sensing and overlapped seeks. A light-emitting diode (LED) logic probe is built in to assist in servicing.

The controller costs $1,900 from the firm at 1901 Old Middlefield Way, 94043.



Packaged on a circuit board, the TDC802 controller slides into Nova CPU chassis.

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MMI Adds Micromini

SUNNYVALE, Calif. – MMI/Systems, the OEM computer systems division of Monolithic Memories, Inc. here, has introduced the Micromini System 300, a 16-bit microprocessor that has instruction execution time of less than 1 μsec, the firm said.

The System 300 CPU is available in two operating performance ranges. The 301 CPU ($1,250 in unit quantities) allows instruction execution time of 900 nsec, and the 304 CPU ($625 in unit quantities) has an execution time of 1,800 nsec.

Read/write memory elements for the system are either 4K 16-bit-word stand-alone memory blocks or a pair of cards based on 4K-bit dynamic random-access memory (RAM) devices.

Peripheral interfaces are available for teletypewriter, paper tape reader/punch and RS-232 channels. Future plans include both floppy and hard disk controllers, according to the firm at 1165 East Arques Ave., 94086.

On DG 6012 CRTs

Program Set Allows Full Screen Use

FORT LEE, N.J. – Data General Corp. (DG) 6012 display terminals, positioned as a teletypewriter replacement, can now provide readily usable, full-screen capabilities as the result of a program set developed by Systems RDI Corp. here, Systems RDI said.

With this package, DG users can access the entire screen for both input and output. CRT.LB operates in Page mode under Rdos on Nova and Eclipse minicomputer series and requires the screens be full-duplex.

CRT.LB provides a full set of I/O instructions specifying screen starting location for the transfer and transfer length.

Data is input to the program and output from the program in standard A2 format. The package will output any Ascii string, whereas the input package has four entries: alphabetic (A to Z); string (space and all displayable characters); integer (0 to 9); and dollars and cents (0 to 9 plus comma and period symbols).

In the case of dollars-and-cents input, commas are accepted as valid input characters, but are not displayed. Decimals are displayed, so the underscore string printed is one character longer than the length specified. Neither decimals nor commas are transferred to calling programs.

Alphabetic and string input is transferred to calling programs as input, blank filled. Integer and dollars-and-cents input is right justified, zero filled.

On all input the cursor is under complete computer control and will not respond to operator cursor commands. Similarly, commands such as CLEAR, TRANSMIT and the like are ignored.

Input Errors

Input format errors are automatically treated by the system. The bottom line of the screen is reserved for error messages. When a set of characters of length longer than requested is input, the input field will revert to underscores and the input characters will appear within brackets at the left of the bottom line followed by a blinking message, "too long."

In the case where noninteger, nonalphabetic or non-dollars-and-cents data is not acceptable based on the calling sequence and is input, the entire field, including the offending characters, will be treated in the same way as the too-long case, with the appropriate message blinking.

The package is available under license for a one-time fee of $3,000. A DG formatted library file, CRT.LB, will be provided in dump format on paper tape along with user documentation and calling sequences.

An option available to users of CRT.LB is the FMTIN and FMTOUT set. FMTIN operates as a stand-alone program and allows the user to sit at a screen and key in any screen format desired, including control characters. Upon completion of the format input, a format number will be assigned and displayed by FMTIN and the format will be stored on disk.

FMTOUT operates under Rdos and displays the format on the appropriate CRT screen, when called, giving the format identification number (assigned by FMTIN) and the appropriate Rdos CRR channel number.

The price for FMTIN/FMTOUT under license is a one-time fee of $1,000 from the firm at 2460 Lemoine Ave., 07024.



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Order Entry Flows Like Wine Using DP-Based Warehousing

SAN FRANCISCO – A minicomputer is speeding the flow of wines from cask to consumer at a wine distributor in Northern California.

Gallo Sales Co., an independent company that distributes U.S. brands and imported wines is using the recently installed system to control a complex material-handling system that fills thousands of orders daily.

The computer, which has already reduced costly overtime and order-filling errors, has helped the company locate mechanical problems inherent in the material-handling system.

It is also helping to prevent system breakdowns by indicating which mechanical elements are not operating within tolerances.

Called Computerized Order-Picking Equipment Systems (Copes), the system uses a Hewlett-Packard (HP) 9603 industrial measurement and control system situated in offices adjacent to the warehouse to select the ordered wine from rows of cases of stock. The system then controls their flow through an intricate maze (more than two miles) of both gravity and powered conveyors to the delivery trucks.

Accuracy a Benefit

Paul Anderson, operations manager of Gallo, said the most significant benefit is accuracy. Under the earlier, semiautomatic system without the computer, the company could expect about 60 errors in orders every day.

"Already, errors have been reduced by about 50%," Anderson said, predicting it would eventually cut 99% of the errors.

Computer software for Copes was designed and implemented by Virtual Memory Systems of Orinda, Calif.

The process begins with the salesperson taking the order from the retail store. It is entered the next day into a remote IBM 360/40. This computer then makes the necessary accounting and inventory tabulations and generates a magnetic tape which becomes the input to the Copes system.

The magnetic tape containing the day's orders and route information is delivered daily from the computer center to arrive here before 4:00 p.m. when order filling and truck loading begin.

The tape is read onto the HP 7901A disk drive using an HP 7970B magnetic tape transport, and the order filling begins by the controlled opening of three tiers of escapement gates and the automated starting and stopping of conveyors.

All the warehouse equipment is activated by signals received from the computer through an HP 6940A multiprogrammer, a programmable, bidirectional digital multiplexor.

When signaled by the computer, the HP 6940 sends a 15-volt signal through any of 84 solid-state relays which operate the electromechanical devices in the system.

A feedback 15-volt signal acknowledges the action has taken place. The escapements allow one case at a time to slide onto the high-speed conveyors.

As each case is released from the escapement on its way to the loading docks, it is scanned by a photo-electric control, and the count is reported to the computer, assuring the accuracy of the order and the spacing of cases on the belts.

When the order is completely picked, the computer continues to monitor its location on the conveyors. From time data in its memory, the computer knows when the order has moved far enough down the conveyors to permit the next order to be filled.



An operator of the automated distribution system at Gallo Sales Co. monitors the flow of thousands of orders each evening using a Hewlett-Packard 9603 industrial measurement and control system.

As orders flow to the truck, the next shipment is directed to the next truck by a three-way hinged conveyor divider. In this way, three trucks can be filled at the same time.

The computer also detects malfunctions of the mechanically operated devices in the material-handling system. It does this by measuring the time it takes for the device to operate once signaled by the computer to operate.

"The mechanical side of the system such as the conveyors and the escapements have been here for many years," Anderson said. "By now removing operator fatigue almost entirely and, with it, the human errors, the Copes system has helped us discover where the deficiencies in the mechanical system are, allowing us to make corrections."

The warehouse also contains a voice communications system with six terminals for communication between the system operator who oversees the order-filling process and the loading docks.

The operator views a video display terminal which shows him which orders are being filled and which wines they contain. Using this information and his override switches, he can control the system manually, should that become necessary.

The Copes system was programmed in Fortran on the HP 9603 computer which includes the HP 21MX processor.

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Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**
New York	**Summit Hotel**	**Feb. 23-24**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

San Francisco	**Berkeley Marriott**	**Nov. 10-11**
New York	**Essex House**	**Jan. 26-27**

Data Base Design

Given in association with Leo J. Cohen and Performance Development Corporation, this three-day seminar is a package-independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimum File Organization/Indexing Techniques, File Integration, and much more.

Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300.

Denver	**Denver Hilton**	**Dec. 1-3**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

New York	**Summit Hotel**	**Oct. 22-24**
San Francisco	**Hyatt Regency San Francisco**	**Nov. 12-14**
Chicago	**Hyatt Regency O'Hare**	**Nov. 19-21**

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Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

Dallas	**Hilton Inn**	**Nov. 10-11**
Miami	**Marriott Miami Beach**	**Nov. 17-18**

Data Communications Course #1020 – Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

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COMPUTER INDUSTRY

CI Notes

R2E Finds U.S. Associate

SOLON, Ohio – Realisations Etudes Electroniques (R2E) of Paris, France, has signed Warner & Swasey Co. as the exclusive manufacturer and marketer of its Micral microcomputer line in the U.S. and Canada.

The pact between the two firms occurred about a year and a half after R2E announced it was looking for a business associate in the U.S. [CW, April 10, 1974]. The Micral is built around the Intel 8080 chip.

Warner & Swasey is marketing its Micral-based small system for industrial DP applications such as eingineering data analysis, advanced accounting and inventory control systems as well as communications systems.

The firm also offers the Comstar System 4 and System 8 microcomputer lines, designed for industrial control applications.

Burroughs, Redactron Terms Set

DETROIT – Burroughs Corp. has reached a definitive agreement for the acquisition of Redactron Corp., maker of word-processor systems and a variety of components and peripherals for computers.

The terms give Redactron holders at least $7.50 worth of Burroughs stock for each share of Redactron held. With about 1.2 million outstanding shares, the transaction would be valued at about $8.8 million.

Valcomp to Acquire Quelex

CUPERTINO, Calif. – Two suppliers of maintenance and replacement parts for Xerox computers have agreed in principle to combine.

Under the proposed agreement, Tymshare, Inc. will acquire Quelex Data Systems, Inc. for an initial cash payment of about $1.5 million and additional payments based on the combined performance of the firm and Tymshare's Valcomp division over three years.

Quelex would become part of Valcomp, giving Xerox users a single source for service. In addition to service for Xerox users, the new firm would continue to provide parts and service for other makes of equipment as well, Tymshare said.

Supershorts

MRI Systems Corp. has signed a distributorship agreement with CJK Co., Ltd. of Tokyo to sell the System 2000 data base management system in Japan.

– – –

The Institute for Advanced Computation at the National Aeronautics and Space Administration's Ames Research Center has become the 900th member of the Western Electronic Manufacturers Association.

– – –

Computer Automated Products, a British firm which markets and supports Boole and Babbage products in Europe, has changed its name to Computer Program Products.

– – –

Caci, a management consultant and software group, has expanded its operation to Europe where it will specialize in consulting on data base and teleprocessing under the direction of Ian Palmer.

– – –

Microdata Corp. and Potter Instrument Co. GmbH of Vienna have signed an agreement covering sales and service of Microdata's line of magnetic tape transports and formatters in the European OEM marketplace.

But Supports Software Patentability

Adapso/SIA Asks Patent Case Dismissal

WASHINGTON, D.C. – Although the Association of Data Processing Service Organizations' Software Industry Association (Adapso/SIA) believes software should be patentable, the history of Dann vs. Johnston makes it an inappropriate vehicle with which to approach the Supreme Court.

In an amicus curiae, or friend of the court, brief filed here recently, the industry association urged the Supreme Court, which agreed to review the suit [CW, May 21], to dismiss the case.

However, if the court should consider the case, it should rule in favor of software patentability, the association said.

The writ of certiorari bringing the case to the court "should be dismissed as improvidently granted because of the inadequate record, the jurisdictional barrier to the reconsideration of a central factual issue and the inappropriateness of the principal question for which certiorari was granted," Adapso said.

The association observed the record does not provide the factual basis that would enable the court to undertake a thorough inquiry into the "complex technological issues of special-purpose computer construction" that would be necessary to consider what the U.S. Patent Commissioner presents as the key issues.

The most basic technological issue – the finding of the Patent Office's Board of Appeals "that programming a general-purpose computer restructures the computer into a different machine – is not jurisdictionally subject to review" because statutes bind the Patent Commissioner by the appeal board's determinations, the brief said.

The writ of certiorari, brought by the petitioner, C. Marshall Dann, Commissioner of Patents and Trademarks, was a "nonjusticiable intraagency dispute."

Dann petitioned the Supreme Court to hear the case after the Court of Customs and Patents Appeals (CCPA) affirmed the patentability of Johnston's program [CW, Oct. 9, 1974]. Previously the U.S. Patent Office had rejected Johnston's application for a patent.

Technological Equivalents

Turning to why software should be patentable, Adapso said "computer innovations embodied with stored computer programs are legally entitled to the same patent protection as innovations embodied in wire-connected electronic circuits, for technologically 'hardware' and 'software' are equivalent.

"The designer of software, like any engineer, builds machine structures, not methods of doing business; he develops machine solutions for machine problems," the brief said.

The basic issue in the case – whether programs are patentable – cannot be resolved by a decision in this case, Adapso continued.

"Whether a particular machine constitutes patentable subject matter depends on the well-established principles of patent law – not whether the machine is built with one form of construction (software) as against another (hardware)," the brief said.

"To base disparate legal treatment upon a mode of construction has no justification in law, technology or common sense," the brief continued.

"The facts that a programmed computer . . . is a machine and the innovative aspect of it is a machine structure cannot be overcome by petitioner's legal arguments," Adapso argued.

Adapso/SIA, which represents about 62 firms in the computer field, about 70% of which concentrate in the software products in industry, emphasized the importance of software protection to the health of the DP industry.

Copyright protection is "inadequate and inappropriate to protect innovative machine structures," the brief said.

"In a field dominated by IBM, the growth of the small independent software company has been stifled by the bundling practices of the hardware manufacturers," Adapso said.

Because of the lack of patent protection, the industry has been forced to rely on trade secrecy, which has deterred disclosure of innovations, Adapso said.

Two Mini Firms Enlarge Product Ranges

By Molly Upton
Of the CW Staff

"Damn the torpedoes – full speed ahead!" seemed to be the message from both Computer Automation Inc. (CA) and General Automation, Inc. (GA) as within two weeks of each other they unveiled their answers to possible incursions by the semiconductor houses.

Undaunted by the terminations, both quiet and thunderous, of their previous entanglements with advanced technology designed to lower the price/performance ratio, they have tried again. But the techniques differ.

GA, whose silicon-on-sapphire (SOS) chips, hailed as a well-proven aerospace technique, died a splashy death, has rebounded with custom LSI chips from Synertek, in which it has a financial interest.

The chips are modeled on the architecture of GA's SPC-16, which led Sam Lane to claim the microprocessor is at least twice as fast as anything on the market. Lane is marketing manager for GA's Computer Products Group.

These N-channel devices are faster than the SOS product, he said. Asked if GA wasn't burned by the SOS experience regarding custom work, he explained this is different.

The increase in yields is on an order of magnitude, and the relation with Synertek is different than that with Rockwell, its SOS supplier, since GA has an investment in the semiconductor firm.

But over at CA, which has "quietly buried" its LSI-1, based on a custom MOS chip, the new product line uses "off-the-shelf TTL components," President David H. Methvin said.

"We use technology for one purpose: to reduce the cost of the product," he explained.

The LSI-1 was never shipped. The yield was low and the chips were not interchangeable without some adjustment, he explained.

"It was a little embarrassing. It died a quiet death," he said.

Although the techniques differ, the motivations are very similar – to get a range of compatible products to market and make sure the bottom end of the range is priced well under $1,000.

"We have to have micros to protect our mini business," GA's Lane said. "Whoever gets a contract for micros will also get the mini order."

With CA's latest offering, the packaged Alpha 3/05, "minis have dropped to the threshold price of $700," Methvin said.

Both firms are stressing the upward compatibility of their lines and are extending their product ranges on the upper

(Continued on Page 34)



CW Photos by M. Upton

Methvin Lane

CDC Forms Group, Sets Sights On Small, Distributed Systems

By a CW Staff Writer

MINNEAPOLIS – Control Data Corp., setting its sights on the small computer and distributed DP markets, has formed a new group to focus the company's resources on these areas.

Hugh Henig will head the Data Processing and Terminals Systems Group as vice-president and executive, reporting to Thomas G. Kamp, president of CDC's peripherals products business.

Henig had been vice-president and senior staff officer for product and services strategy since 1974. He was previously vice-president of the Service Bureau Corp. (SBC).

He will have operating responsibility for four CDC units engaged in the development and manufacture of small computer systems, data entry and other peripheral subsystems and computer terminals, the firm said.

The group's function is "to focus more efficiently CDC resources that develop small systems hardware and software of similar characteristics either as standalone products or subsystems used in distributed data processing environments," Kamp said.

Henig explained the move as "evolutionary" because none of the activities are new to CDC.

From a manufacturing, engineering and systems as well as marketing point of view, there is a lot of commonality in configuring small business systems, data entry systems and other peripheral subsystems, he observed.

In addition, CDC has been cognizant for some time of the increasing need to satisfy users by some means other than central-site processing, he said.

Henig acknowledged this new thrust could well lead to a new area of customers for CDC, specifically in the small systems area. The group will not immediately enter the small user market, but "I think we have a great deal to offer," he said, drawing upon knowledge of user needs gained from SBC and small systems expertise.

First, however, "the sales force needs to grow in size and understanding of requirements for small business users," he said.

GA, CA Extend Offerings In Minicomputer Range

(Continued from Page 33)
end as well.

GA announced its 440, which it said is a completely new machine in design and uses Schottky medium-scale integration (MSI). Lane said he expects it to replace the SPC-16/80 and 85.

"We felt we have gotten to the point where we can compete in the mega mini area," he said.

GA is experiencing high interest from customers at both ends of the product spectrum, Lane said. "Customers had felt constricted by the lack of our product breadth," he explained.

Solution Series

With its line of products ranging from the micro-based 16/110, selling from $531 in OEM quantities, to the 440 "maxicomputer," which costs $8,950, GA provides customers with a range of compatible products, Lane said [CW, Oct. 15].

CA has quietly formed a Commercial Systems Division as part of its recent reorganization and recently acquired rights to software written for its Megamini system. The system handles up to 24 terminals for on-line inquiry."

Methvin said his firm is being quiet now because "we don't want to turn on users and not be able to handle them." The firm is taking care to ensure that if a system goes into the field it can provide support for it, he said.

End of Two Eras

Although 1975 may be known as the year when both CA and GA buried their technological misadventures, it will also be known as the end of the recession for them.

Both firms reported business for the recent quarter was better than that of a year ago, when they began to feel the effects of the economy.

Business is up sharply at CA and the search for bodies is on.

Methvin said activity began picking up in May, but he didn't know if it was a blip in the economy or not. Now he feels it's definitely not a momentary blip, and he plans to increase the workforce by 90, which will make the firm bigger than its previous peak of 444 in July last year.

The demand appears to be across the board in industry sector and customer size, he said. "It's a nice healthy feeling."

Most order activity is for the Alpha 3/05; the bulk of shipments are for its 220, which he described as midrange. The bulk of business is in the low end of the line, but orders are also across the product line, he said.

The distributed I/O system is taking off, he added. Methvin considers it the second most important contribution CA has made to the industry. The first was the concept of the Naked Mini.

The market reaction to the distributed I/O product was delayed, he said. At first people couldn't believe it and said it was too cheap and suspected a

(Continued on Page 35)

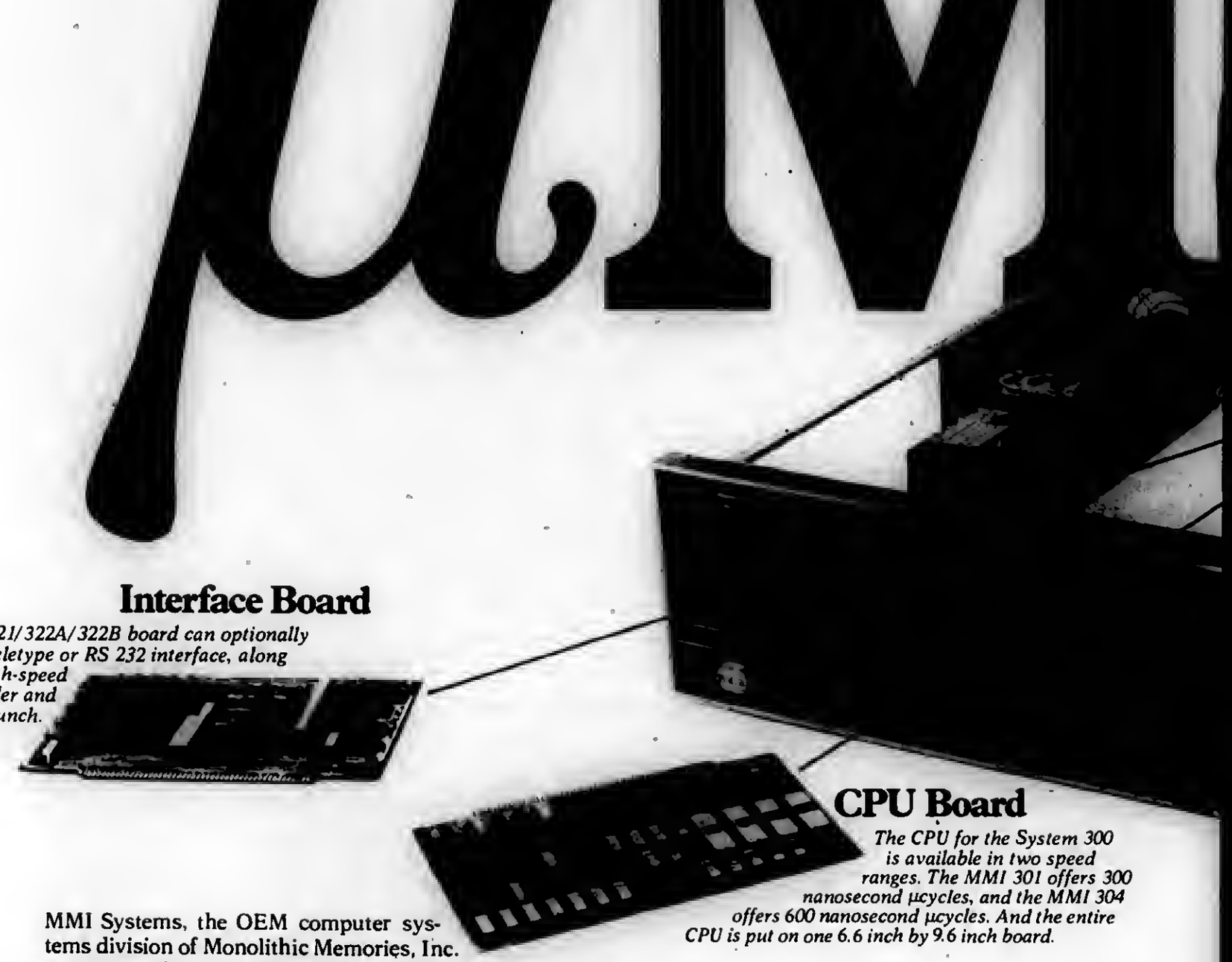


CW Photos by M. Upton

Alpha 3/05s (left) await shipment; GA 440s at right are destined for the Bank of America for distributed processing in an electronic funds transfer system.

MMI Systems announces the first microprocessor that gives you better than minicomputer performance.

The μMini



Interface Board

The MMI 321/322A/322B board can optionally contain a Teletype or RS 232 interface, along with a high-speed tape reader and tape punch.

CPU Board

The CPU for the System 300 is available in two speed ranges. The MMI 301 offers 300 nanosecond μcycles, and the MMI 304 offers 600 nanosecond μcycles. And the entire CPU is put on one 6.6 inch by 9.6 inch board.

MMI Systems, the OEM computer systems division of Monolithic Memories, Inc. announces the μMini System 300. Built on the blazing performance and proven reliability of MMI's bipolar LSI products, the System 300 gives you less than 1 microsecond instruction execution time. Not bad for any machine; terrific for a 16-bit microprocessor!

Multiple source software

The μMini System 300 is software-compatible with Data General's Nova* which means your programmers and systems may already speak the 300's language, and vice versa. In addition, there are four completely debugged, commercially available operating systems which will handle program development and mass storage for the System 300. Pick the one you like.

*Trade Mark Data General

Lowest cost today—Lowest cost tomorrow

Take a look at published prices. The MMI 304 CPU is priced at only $625 in unit quantities. A 16K semiconductor memory to go with it is $2,100 in unit quantities. Volume discounts extend to 45%. This means you can buy a 16K computer for less than $1500. Compare it to any other computer, regardless of performance, and see for yourself. Then look ahead: We will continue to apply our leadership in LSI semi-conductor technology to further reduce the cost of our μMini System. This will also provide even better performance and reliability for the systems.

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Fujitsu Made It Possible, Amdahl Says as 470 Bows

By Patrick Ward
Of the CW Staff

SUNNYVALE, Calif. – Without Fujitsu's help, "we would have been hard-pressed to come out with a large-scale computer in the time frame we did," Gene M. Amdahl said as his company introduced its IBM 370/168-compatible machine, the 470/V6, last week.

Amdahl, once manager of architecture for the System 360, said he founded his company because he saw room for a small independent to challenge IBM's large machines.

The 370/135 and 370/145 were the design center of IBM's line, he said. This cost-oriented commitment to a single technological pattern benefited the company's mid-range but made it harder for IBM to build the optimum large machine, he said.

Amdahl also felt the typical large-machine user had enough in-house expertise to be independent of any one vendor.

When Amdahl Corp. was launched five years ago, "it was a challenge to develop a CPU of that power, but financing was a far bigger challenge," he said.

After an initial investment from E.F. Heizer, a venture capital firm, "it became apparent that it was almost certain no more money could be raised in the U.S.," Amdahl said.

"Fortunately, we could link up with Fujitsu, which offered $5 million and a joint technical program."

In October 1972, Nixdorf invested $6 million with the idea of forming a business relationship that never materialized. U.S. investors put in $7.8 million more and Fujitsu added $6.2 million.

In 1974, Heizer, Fujitsu and American General, a Texas insurance firm, put in $18.7 million.

"Our financing is now in adequate shape to carry us through our program," Eugene R. White, Amdahl president, said.

Fujitsu has three members on Amdahl's 11-member board and owns 20% of the company's common shares, he said.

While the 470/V6 shares logically similar architecture with the 370/168, a spokesman said Amdahl only uses IBM technology that is in the public domain and does not expect any trade secret problems.

Fujitsu is licensed to build the 470/V6 in Japan and will jointly market it with Amdahl in much of the world. The Japanese company also builds the CPU and memory subsystems for the U.S. machines.

GA, CA Extend Mini Offerings

(Continued from Page 34)

hooker, Methvin remarked. Then they came back and realized that was the entire product, he said.

Customers seem to be guarding against inventory buildup and are shipping systems out the door as fast as they receive them, he said.

GA Shipments Up

At GA, business is improved over where it was before the crunch, Lane said, and shipments this quarter will be above those of a year ago.

As the minicomputer makers delve further downward on the price curve, the definitions and distinctions between minicomputer and microcomputers are becoming more vague.

Lane said a microcomputer uses LSI technology and semiconductor memory, can be bought at the board level and is used in an application where it loses its identity. In a minicomputer, the user can add more memory and design his own I/O, he explained.

Methvin made the distinction on whether a unit was packaged. If it can be bought at the chip level, it is a micro; if it's packaged, it's a minicomputer, he said.

Although the microprocessor is seen by many as a threat, Methvin said micros are going to bring people who are afraid of computers, for either the price or reputed complexity, into the realm of computers.

After learning about micros, they may well find they need a bigger machine and then become minicomputer customers, he said.

If the micro suppliers get to the point where they are packaging their units and supplying software and support, then they'll be minicomputer companies, he said.

"There may be different names in the game, but the one constant is fierce competition," Methvin said, adding he doesn't see a semi house having any advantage over a minimaker in that area.



Box
The complete System 300 is provided with a full function, front panel, power supply, teletype and tape I/O connectors, a 12-slot card file and an I/O buffer for driving external card cages. The specific CPU memory and controller configuration is at the user's option. All printed circuit boards are 6.6 inches by 9.6 inches.

Memory Board
The System 300 semiconductor memory can be configured in 4K word increments up to 32K words. The MMI 308 provides addressing for up to 32K words, refresh and standby logic, the bus interface, and the first 4K words of memory. The MMI 309 is driven by the 308 and contains up to 16K words per board.

Kit *The MMI 300 CPU kit option is available for those who would like to assemble their own CPU. All components required for the CPU are provided along with a schematic of the CPU function.*

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A new concept from MMI Systems. Virtual unbundling means simply that we will sell as much or as little computer system hardware as your application requires. Whether your needs call for a complete computer system, subsystem, boards, kit parts, or components, they are all made by MMI and available to you. Who else can match this?
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The System 300 utilizes the latest state-of-the-art LSI semiconductor components, and all μMini System 300 components are available with −55°C to +125°C temperature ratings and Mil Std 883 processing. Militarized boards in the System 300 meet all applicable Mil specs, are rated for −55°C to +100°C operation, and include heat rails for conductive cooling and pin and socket connectors for rugged mounting.

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In Terminal Mart

Reception of 2644 Pleases HP

By Molly Upton
Of the CW Staff

CUPERTINO, Calif. – Reception of Hewlett-Packard Co.'s (HP) second entry in the terminal marketplece, the 2644, has been "better than expected," said Ed Hayes, marketing manager for the firm's new Data Terminal Division.



Ed Hayes

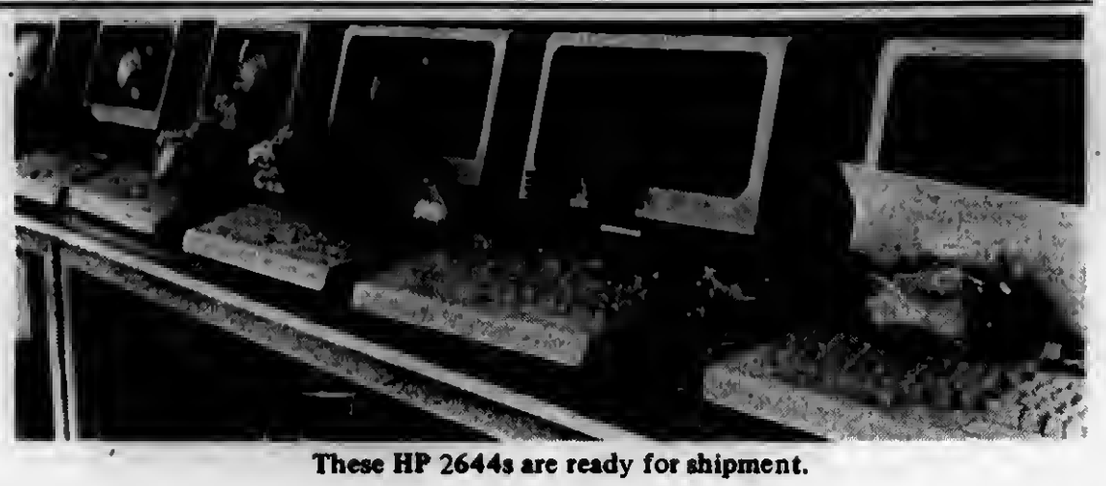
The terminal division intends to produce a terminal line that will complement the systems division and also expand its non-HP business, said Hayes.

He expects to announce at least two more terminals within the next year, he said.

The 2644 has a much larger OEM potential than the 2640, Hayes said. Currently about 70% of 2640 shipments are HP-related.

With the dual mini 3M Co. cartridge feature, OEMs can provide more added value in the form of software, he said.

HP expects to ship its 2,000th 2640 within a year of its announcement, he said. The big celebration at HP will be when Number 2640 goes out the door, Hayes said.



These HP 2644s are ready for shipment.

Currently HP has positioned its terminal products to cover ebout half of the terminal market, he said. The 2640 end 2644 cover the range of products with features such as block mode, edit and format and local mass storage end provide some of the features normally found only in user-programmable terminals, he said.

"We're still very new," he said, when asked why the range did not include user-programmable units.

However, the thrust of the division will be to provide units with increased speed and capebility, he indicated.

In the future, HP may offer terminals with floppies, alternate character sets and APL, he said, as well as user-progremmable units.

These higher performance features will be treeted as new products, but he said he expects the older products to be able to incorporate many of these.

The floppy terminal should be announced soon, he said, but was a little more vague on the APL terminal. "We're taking a herd look at an APL terminel," Hayes said. Signs point to a possible announcement next spring.

On the 2640, HP came out with e forms-drawing option, but it began delivering orders initially without that capability as it had difficulty getting the read-only memories (ROM) for that feature. However, HP is now delivering the forms-drawing ROM, he said.

A year from now, Hayes said he expects orders to be running about 60% for the 2640-type of product and 40% for the 2644-type.

Getting your data from here to there

A special supplement on Data Communications Network Configurations in the November 26th issue of Computerworld.

You can run into a lot of hangups planning and operating a data communications network. Your DP staff - including managers and technical specialists - has to make important decisions on a lot of expensive items like terminals, line speeds, modems and network configurations, to name a few. These networks are usually planned years in advance, and when they are put together, they're built to last. Yet the industry is in a constant state of change, and networks are often being upgraded with faster equipment, newer sites, more efficient lines, etc. So proper planning is essential.

We'll be taking an in-depth look at the changing world of data communications networks in the November 26th issue of *Computerworld*. And we'll give special emphasis to how they should be planned. Edited by Ron Frank, this supplement will be filled with input from users who understand this environment with all its implications, and you'll get the benefit of their experiences. You'll see stories that evaluate common uses of data communications, like batch versus on-line, private lines versus dial-up lines, all-digital versus analog lines, and the use of newly emerging carriers. And you'll see stories that point out ways you can get the least cost on your configurations.

If you're involved with data communications - or if you will be in the future - you should be reading this special supplement in the November 26th issue of *Computerworld*. And if you're marketing data communications products or services, you should advertise them here. But don't miss the November 7th ad closing date. Contact your area *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Data Dimensions, Inc.

President Says

DG Expects Sales Growth in '76

NEW YORK – Data General Corp. (DG) expects next year to be a year of "somewhat stronger revenue growth" than this year was, President Edson D. De Castro said recently.

In reviewing a flat year of order activity, De Castro said part of the flatness stemmed from the firm's scrutiny of orders before they were accepted in efforts to reduce cancellations and accounts receivable.

"Much of the past year's strength has clearly come from acceptance of our larger systems – the Nova 840s, 830s, 2/10s and Eclipses," he said.

And this growing demand, which came from end users, more than offset the weakening OEM demand levels, De Castro said.

"As a result, a considerable volume of our current business is coming from end users for larger systems with full complements of peripheral equipment," he said.

Temporary Shift

"I believe, however, this shift in the mix of our business is temporary. The contribution of the OEM and systems house to the system's value is a significant and permanent part of this marketplace.

"And DG has hundreds of customers in this segment of the market that we intend to serve over the long range with products and services," he said.

"If our incoming orders are to be believed, the period of relatively flat order activity may be behind us. After about a year of little or no growth, order activity appears to be increasing with some consistency," De Castro said.

"This is largely a U.S. phenomenon and is resulting mostly from end-user activity, but there is some indication of OEM strength.

"Whatever marketplace and economic difficulties we have been through, they appear to be largely behind us.

"As an organization, we are in better control of our operations, and in product offerings we are in a far stronger position than we were a year ago," De Castro said.

Reducing Inventory

DG has been reducing inventory levels through automated inventory controls and material requirements planning, he said.

"It may be difficult to show further reductions as we prepare for increased output, but the actual value of inventories for the year should certainly be below that of a year ago," De Castro said.

The firm also introduced more stringent requirements for booking orders beginning last fall.

"These actions may have had a greater effect on keeping the incoming order rates flat than the marketplace itself," he said.

"Had we not aggressively cleaned out these shaky orders, we would have seen an increasing level" of accounts receivable and bad debts as well as orders, he said.

Data General's receivables are now running about 85 days, he said.

Manufacturing unit output has increased with a reduction in direct labor last fall, he said. The labor reduction has been in its Far East core stringing facility and in the closing of a facility in Canada, De Castro said.

The Westbrook, Maine, facility, has about 50 people now and "employment will increase as business conditions permit," he said.

DG revamped its field sales organization during the year, recruiting more qualified people, but keeping the number relatively constant, he said.

The firm has also been active in new market segments, specifically business DP, communications and point of sale (POS), he said.

Small Systems Demand Weak

"Frankly, the growth in demand for small computers has been weak in the past year, by historic standards. For DG, orders have been generally flat throughout most of the period.

"The only satisfaction we can take is that we correctly forecast revenue growth during this uncertain year. The economic slowdown clearly had an effect on overall demand levels in the OEM segment of our business, but end-user demand held up remarkably well," De Castro said.

"There are advantages in adversity, however. We have used the past 12 months to mature as a company and to establish ourselves in new segments of the market," he said.

The Eclipse market "appears to be developing slowly in a fashion similar to the original scientific market for the first minicomputers 15 years ago. I should point out, however, that acceptance of the C/300s has been quite strong so far and that we have won OEM as well as end-user orders for the system," De Castro said. The data communications area is "one of the fastest growing segments of our business and the need for new and advanced offerings has been strong," he said.

"Third, our POS supermarket system has reached a level of maturity where discussions with potential customers have become worthwhile. The system now includes fixed optical scanners of our own design," he said.

The firm is "beginning a controlled and high-level marketing effort," De Castro added.

"The application of scanning techniques itself is maturing slowly, however, and legal issues and consumer concerns may dictate a slow pace of application. As a result, we do not foresee significant revenue potential in 1976," he said.

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Please direct all material to:

Cheirperson
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of Administrative Data Processing
Regent Administretive Center 303
University of Coloredo
Boulder, Coloredo 80309

All applications will be kept strictly confidential.

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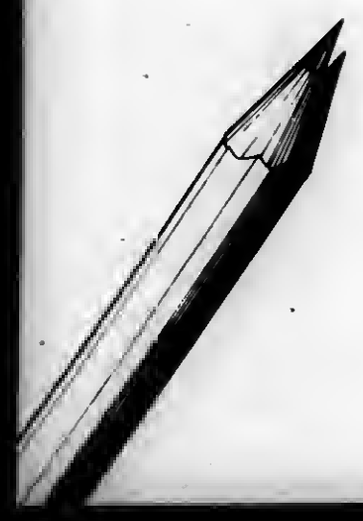
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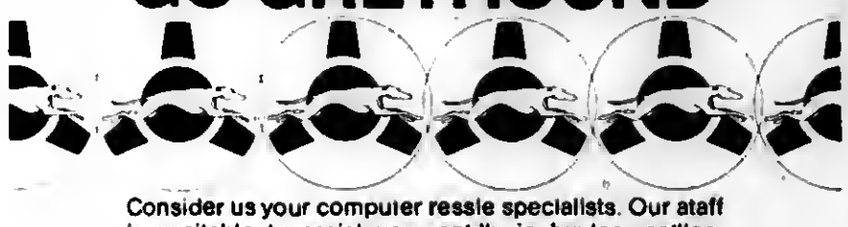
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Sanders Turns Profit for '75; Founder Bids Farewell

By Ronald A. Frank
Of the CW Staff

NASHUA, N.H. – Royden C. Sanders bid a somber and final farewell to the company he founded and once led at the annual meeting of Sanders Associates, Inc. recently.

Much of the meeting was taken up with reserved though often bitter comments between Harold W. Pope, president, and Sanders, who resigned from the firm last February after what Sanders said was a "coup" designed to oust him.

Pope explained the principal reason for Sanders' exit was that he would not take action to reduce the losses from the data systems group and was "unwilling to listen to other directors."

On the financial side, Pope reported earnings for fiscal 1975 of $15 million or $3.27 a share compared with a loss last year of $19 million or $4.17 a share.

The profit was made up of $1.5 million income before taxes and $13.4 million in extraordinary credits.

The credits included an exchange of new 12% convertible debentures for earlier outstanding 5% convertible debentures and an operating loss carried forward of $10 million for "financial statement purposes."

SDS Suffers Loss

Sanders Data Systems (SDS) suffered a loss of $9.3 million compared with a loss of $15.8 million in the previous year.

Sales for the period were $25.3 million which compared with $18.7 million in 1974. Pope said SDS was "still a serious problem area, but the company is continuing a serious effort to make it profitable."

The steps being taken to achieve this goal include first shipments of the 8170 series of CRTs which are compatible with the IBM 3270 series. In addition, SDS reduced its expenses and ended the year with the 20% less manpower, Pope reported.

Arthur Carroll, group vice-president in charge of SDS, reported an effort during the year to reduce leased systems in favor of purchases.

Pope revealed the firm had unsuccessfully sought joint-venture marketing and service arrangements to improve the bottom line of the data systems group.

M. Joel Kosheff, vice-president of finance, said he doesn't anticipate the group will be profitable this year, but "it is possible we could be in the black" next year.

John A. Ruggiero, treasurer, told the *Wall Street Journal* one goal is to get the data systems group's volume up to the $40 million to $45 million break-even level as quickly as possible. The projected volume for this year should be $30 million to $35 million, he said.

The Sanders legal suit against IBM is proceeding well, according to attorney Joseph Millimett. The suit is currently in the pretrial discovery phase.

In turn, IBM has 18 persons in Nashua, examining Sanders documents.

The pretrial phase will last 12 to 18 more months, Millimett predicted. He commented he feels confident the case will come to trial in U.S. District Court in New Hampshire.

Working for Memorex

Sanders revealed he has been a paid consultant of Memorex Corp., working on a word-processing product, since his Sanders' salary terminated May 31.

Kosheff said the firm was "unable to negotiate a consulting contract" with Sanders that included a noncompetition agreement and therefore cut off his salary.

Motions by Sanders to delete his name from the corporate name and to limit the age of the board of directors [CW, Oct. 8] were defeated.

The most heated exchange between Sanders and Pope occurred during discussion of a motion by Sanders to limit to $100,000 fees paid to foreign agents.

Pope ruled the item out of order. Sanders claimed the company had already paid $40 million to outside agents to get contracts with the governments of Nigeria and Saudi Arabia.

Pope denied the payments but said the company was negotiating for contracts based on an expanding interest in equipment by the Opec countries.

"We will pursue profitable business ventures, but if Sanders or anyone else believes we are engaged in improper business practices, they are misinformed," Pope said.

All current directors with the exception of Sanders were re-elected. This marked the first time in the 24-year history of the company that Sanders was not involved in its management.

NCR Earnings Dip 20% in Third Quarter

DAYTON, Ohio – NCR Corp.'s earnings dropped 20% in the third quarter and were 6% in the nine months below those of the comparable year-ago periods, although revenues in each period rose.

Earnings for the quarter fell to $15.9 million or 66 cents a share compared with $19.9 million or 81 cents a share last year.

Revenues for the period reached a new high of $521.6 million, compared with $488.1 million in the same period last year.

For the nine months, earnings declined to $48.6 million or $2.01 a share compared with $51.8 million or $2.19 a share in the same year-ago period.

Revenues rose 12% to $1.5 billion compared with $1.35 billion last year.

Data terminals and computer systems contributed to revenue growth but free-standing business machines showed a substantial decline, the firm said.

"Profits continue to be adversely affected by reductions in manufacturing schedules carried out earlier this year to reduce inventory levels. This factor, plus NCR's conversion to electronic production, has resulted in excess manufacturing capacity and higher fixed costs charged to operations," according to William S. Anderson, chairman and president.

Incoming business is running approximately even with last year, he said. Many customers, especially in the retailing industry, have postponed systems changes and expansion programs in the face of economic uncertainties.

In addition, confusion about possible legal restrictions on electronic funds transfer systems and proposed restrictive legislation pertaining to supermarket scanning systems are having a negative impact on orders and shipments, he said.

Earnings have also been affected by a substantial falloff in the revenues and earnings of the Appleton Papers Division because of currency exchange fluctuations and higher R&D expenditures, Anderson said.

NCR has carried out a number of cost-saving programs to help offset the impact of the recession, including inventory and personnel reductions. The company has also announced plans to close two small overseas plants and to consolidate manufacturing operations at a number of larger facilities in order to balance manufacturing capacity with the reduced space requirements of electronic production.

Additional economies and further improvements in productivity are anticipated as a result of a comprehensive review being undertaken of all current operations, Anderson observed.

"We are assuming that 1976 will be as demanding as 1975 and are planning accordingly.

"From a longer term standpoint, we foresee a stronger and more stable world economy and a resumption of the above-average growth which our industry has experienced during the past 30 years," he said.

Net Up Almost 10% in Sperry Rand Half

NEW YORK – A 12% gain in revenue from commercial computers in the six months helped Sperry Rand Corp. report increases in revenues and earnings for the second quarter and six months compared with the same periods last year.

Earnings for the second quarter rose 9.7% to $31.4 million or 91 cents a share compared with $28.6 million or 83 cents a share in the same period last year.

Revenues for the quarter rose 5% to $758.1 million compared with $721.9 million in the year-ago quarter.

During the six months, earnings rose 9.8% to $60.5 million or $1.75 a share compared with $55.1 million or $1.60 a share in the same period last year.

Revenues for the half were up 6.8% to $1.5 million compared with $1.4 million a year ago.

"Sperry earnings and revenue progress continued for the 14th consecutive quarter while the overall business climate remained mixed," J. Paul Lyet, chairman and chief executive officer, said.

"New orders for Sperry Univac computer products have held up well in view of cutbacks in the capital spending plans of many commercial customers," Lyet said.

"Orders, which were very strong in the April-June quarter, slowed in this quarter and were up 10% through the first six months of fiscal 1976."

A medium-priced system in the Univac large-scale 1100 series, introduced Oct. 1, is expected to have a "positive impact on orders in the second half of the year," he said.

The corporation's cost-control program contributed significantly to the improvement in pretax profit margin, and its asset management program resulted in reduced inventory and receivable levels, Lyet said.

"Overall," he concluded, "we continue to see progress despite unstable economic conditions around the world."



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XEROX
Three Months Ended Sept. 30

	1975 (000)	a1974 (000)
Shr Ernd	$1.01	$1.03
Revenue	1,025,420	889,953
dDisc Op	.....	(6,175)
Earnings	79,935	81,585
9 Mo Shr	2.10	3.12
Revenue	2,997,932	2,541,402
dDisc Op	b(97,325)	(14,947)
Earnings	166,598	247,341

a-Restated to reflect discontinued operations and an accounting change. b-Includes estimated $84.8 million loss on disposition of discontinued operations. d-Subsequent to June 30, 1975, operating loss related to discontinued operations charged to the reserve for disposition of such operations.

DATAPOINT
Year Ended July 31

	1975	1974
Shr Ernd	$2.11	$1.68
Revenue	46,890,000	34,063,000
Tax Cred	1,473,000	1,051,000
Earnings	4,567,000	3,401,000
3 Mo Shr	.63	.45
Revenue	13,690,000	9,103,000
Tax Cred	498,000	226,000
Earnings	1,477,000	939,000

DPF
Three Months Ended Aug. 31

	1975	a1974
Shr Ernd	$.03	$.13
Revenue	5,686,000	7,147,000
Spec Cred	b28,000	d449,000
Earnings	116,000	538,000

a-Restated. b-From tax-loss carryforward. d-Consists of $206,000 gain on repurchase of debentures and $243,000 from tax-loss carryforward.

HONEYWELL
Three Months Ended Sept. 30

	1975 (000)	a1974 (000)
Shr Ernd	$.75	$.59
Revenue	669,969	621,233
Spec Item	(264)	28
Earnings	14,769	11,443
9 Mo Shr	1.67	2.50
Revenue	1,959,391	1,865,364
Spec Cred	926	95
Earnings	32,660	48,104

a-Restated to reflect accounting change.

RAPIDATA
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.20	$.09
Revenue	3,775,090	2,933,506
Earnings	354,087	157,740
9 Mo Shr	.53	.18
Revenue	11,032,836	8,384,369
Earnings	965,012	329,647

BOLT BERANEK & NEWMAN
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	.....	$.46
Revenue	$7,460,200	6,447,800
aEarnings	(112,100)	b566,200

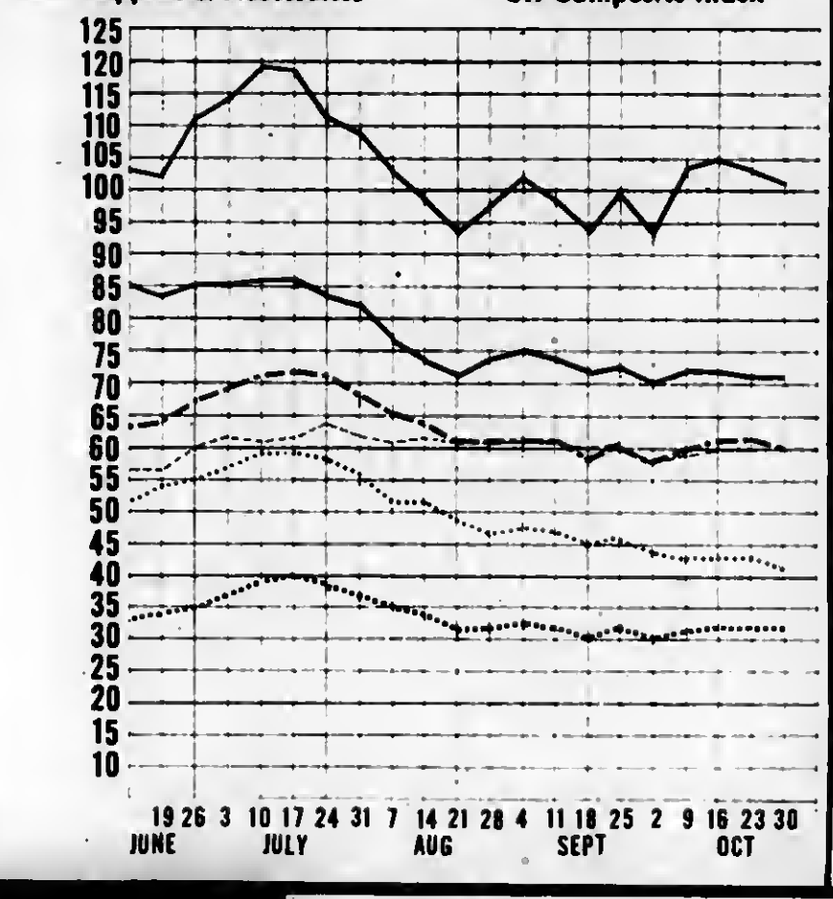
a-Includes charges of $276,000 in 1975 and $96,500 in 1974 from startup costs of Telenet Communications Corp., an affiliate. b-Includes $308,300 gain from exchange of nonexclusive license.

DATA CARD
Three Months Ended Sept. 27

	a1975	b1974
Shr Ernd	$.21	$.15
Revenue	3,860,000	2,075,000
Earnings	319,000	221,000
6 Mo Shr	.38	.32
Revenue	7,044,000	4,039,000
Earnings	582,000	472,000

a-Included operations of Troy Division acquired in May 1975. b-Restated to reflect an accounting change.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 29, 1975

All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE (1)	CLOSE OCT 29 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	85 3/8	-2 1/2	-2.8
O	COMPUTER AUTOMATION	2- 10	9 1/4	-1 1/8	-10.8
N	CONTROL DATA CORP	11- 23	18 1/4	-1 1/8	-5.8
N	DATA GENERAL CORP	10- 38	35 7/8	-1 1/2	-4.0
O	DATAPOINT CORP	4- 26	22 1/2	-1 1/2	-6.2
O	DIGITAL COMP CONTROL	1- 4	2 3/4	0	0.0
N	DIGITAL EQUIPMENT	46-135	128 1/4	-1 1/8	-0.8
N	ELECTRONIC ASSOC.	2- 3	2 1/8	+ 3/8	+21.4
A	ELECTRONIC ENGINEER.	5- 10	8 3/4	+ 1/8	+1.4
N	FOXBORO	23- 42	27 1/2	- 1/8	-0.4
O	GENERAL AUTOMATION	4- 14	5 1/4	+1 1/8	+27.2
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	58-120	101 3/4	+ 1/2	+3.4
N	HONEYWELL INC	22- 40	33 5/8	- 1/2	-1.4
N	IBM	151-224	211	-2 1/4	-1.0
O	MEMOREX	1- 13	8 1/8	- 3/4	-8.4
O	MICRODATA CORP	2- 6	5 3/4	0	0.0
O	MODULAR COMPUTER SYS	5- 19	9 1/4	-1	-9.7
N	NCR	15- 39	24	-1 3/8	-5.4
O	PRIME COMPUTER INC	2- 6	4 3/4	- 1/4	-5.0
N	PERKIN-ELMER	16- 33	25 7/8	- 3/4	-2.8
N	RAYTHEON CO	26- 59	52 1/2	-2 1/2	-4.5
N	SINGER COMPANY	10- 17	9 1/2	-2 3/8	-20.0
N	SPERRY RAND	26- 49	42 7/8	0	0.0
A	SYSTEMS ENG. LABS	1- 5	2 7/8	0	0.0
N	VARIAN ASSOCIATES	7- 18	14	-1 3/8	-8.9
N	WANG LABS.	7- 17	10 7/8	- 3/8	-3.3
N	XEROX CORP	51- 86	56 7/8	-1 3/4	-2.9
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	2 5/8	+ 1/8	+5.0
A	COMMERCE GROUP CORP	2- 4	2 5/8	+ 1/8	+5.0
A	COMPUTER INVSTRS GRP	1- 2	5/8	-	-9.1
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	0- 1	3/8	0	0.0
N	DPF INC	3- 6	4 5/8	+ 1/8	+2.7
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/8	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 1/2	0	0.0
A	ITEL	3- 9	6 3/8	- 1/2	-7.2
N	LEASCO CORP	4- 9	6 5/8	- 3/8	-5.3
O	LEASPAC CORP	1- 1	1/8	- 1/8	-50.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NPS INC	0- 4	1/2	0	0.0
A	PIONEER TEX CORP	2- 7	5 7/8	- 3/4	-11.3
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	8 1/8	- 1/4	-2.9

EXCH		1975 RANGE (1)	CLOSE OCT 29 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	1 1/8	+ 1/4	+28.5
A	APPLIED DATA RES.	1- 10	1 1/2	0	0.0
N	AUTOMATIC DATA PROC	29- 65	57	-2 7/8	-4.8
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	CENTRAL DATA SYSTEMS	3- 7	7 3/8	0	0.0
O	COMPUTER DIMENSIONS	2- 6	3	0	0.0
O	COMP FLECTION SYSTMS	3- 7	6 1/4	- 1/2	-7.4
O	COMPUTER HORIZONS	1- 1	3/4	0	0.0
O	COMPUTER NETWORK	1- 3	3 1/8	0	0.0
N	COMPUTER SCIENCES	2- 6	4 1/2	- 1/2	-10.0
O	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
O	COMPUTER USAGE	2- 4	2 1/8	0	0.0
O	COMSHARE	3- 4	2 5/8	0	0.0
O	DATATAB	1- 2	1	+ 1/8	+14.2
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	15 1/4	+ 3/8	+2.5
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
O	KEANE ASSOCIATES	2- 3	2 1/4	- 1/8	-5.2
O	KEYDATA CORP	2- 3	2	0	0.0
O	LOGICON	3- 5	3 1/2	0	0.0
A	MANAGEMENT DATA	1- 3	1 3/4	0	0.0
O	NATIONAL CSS INC	6- 14	10 7/8	- 5/8	-5.4
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	9- 17	12 7/8	+ 5/8	+5.1
N	PLANNING RESEARCH	2- 6	3 3/8	- 1/4	-6.8
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	3	- 5/8	-17.2
O	REYNOLDS & REYNOLD	10- 24	15 1/2	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/8	0	0.0
O	TYMSHARE INC	7- 21	19 5/8	+ 1/2	+2.6
A	UPS SYSTEMS	2- 4	3 1/4	+ 1/4	+8.3
N	WYLY CORP	2- 4	3	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	8 1/8	0	0.0
O	ADVANCED MEMORY SYS	1- 7	5 5/8	+ 1/8	+2.2
N	AMPEX CORP	3- 7	5 5/8	+ 1/8	+2.2
O	ANDERSON JACOBSON	1- 3	2	0	0.0
O	BRENTVE MEDICAL ELEC	1- 5	3 1/4	- 1/4	-7.1
A	BOLT,BERANEK & NEW	5- 13	6 1/2	-2 1/2	-27.7
N	BUNKER-RAMO	4- 8	4 5/8	- 1/8	-2.6
A	CALCOMP	4- 7	3 5/8	- 5/8	-14.7
O	CAMBRIDGE MEMORIES	2- 5	2 3/8	- 1/4	-9.5
N	CENTRONICS DATA COMP	7- 25	18 3/8	+ 1/2	+2.7
O	CODEX CORP	15- 38	34 3/4	- 3/4	-2.1
O	COGNITRONICS	1- 2	7/8	+ 1/8	+16.6
O	COMPUTER COMMUN.	1- 2	3/4	+ 1/8	+20.0
O	COMPUTER CONSOLES	3- 7	4 1/4	0	0.0
A	COMPUTER EQUIPMENT	1- 2	1 3/4	+ 1/8	+7.6
O	COMPUTER MACHINERY	1- 2	1	0	0.0
O	COMPUTER TRANSCEIVER	1- 2	1	+ 1/8	+14.2
O	COMTEN	2- 5	3 1/2	- 1/8	-3.4
N	CONRAC CORP	12- 26	24 5/8	- 7/8	-3.4

EXCH		1975 RANGE (1)	CLOSE OCT 29 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 3	1 1/4	0	0.0
O	DATA 100	5- 16	9 3/4	- 3/8	-3.7
A	DATA PRODUCTS CORP	2- 6	4	+ 1/8	+3.2
O	DATA TECHNOLOGY	1- 3	1 3/8	- 1/8	-8.3
O	DATUM INC	1- 2	7/8	0	0.0
O	DECISION DATA COMPUT	3- 7	3 3/8	- 1/4	-6.8
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DIXAN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	1 3/8	- 1/4	-15.3
O	FARRI-TEK	1- 1	3/4	- 1/8	-14.2
O	GENERAL COMPUTER SYS	1- 2	1 1/4	+ 1/4	+25.0
N	HAZELTINE CORP	3- 6	3 5/8	+ 1/8	+3.5
N	HARRIS CORP	18- 30	30 1/8	+1 7/8	+6.6
A	INCOTERM CORP	3- 12	9 5/8	+ 3/8	+4.0
O	INFOREX INC	2- 5	2 5/8	- 1/8	-4.5
O	INFORMATION INTL INC	9- 14	12 3/4	- 3/4	-5.5
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	MILGO ELECTRONICS	9- 24	15 1/4	-1	-6.1
N	MOHAWK DATA SCI	1- 5	3 1/8	0	0.0
O	OPTICAL SCANNING	1- 3	2 5/8	0	0.0
O	PENRIL CORP	2- 2	1 1/4	0	0.0
O	PERTEC CORP	2- 9	4 3/4	+ 1/4	+5.5
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1/4	0	0.0
O	QUANTUM CORP	2- 6	3 3/8	- 3/8	-10.0
O	RECOGNITION EQUIP	2- 9	6 1/8	- 3/8	-5.7
N	SANDERS ASSOCIATES	3- 11	8 1/8	+ 5/8	+8.3
O	SCAN DATA	1- 3	1 1/2	- 1/8	-7.6
O	STORAGE TECHNOLOGY	5- 17	12 1/8	-1 3/8	-10.1
O	SYCOR INC	5- 17	16	- 1/4	-1.5
O	T BAR INC	3- 6	6	0	0.0
O	TALLY CORP.	1- 5	3	- 1/8	-4.0
O	TEC INC	1- 4	2 3/4	- 1/4	-8.3
N	TEKTRONIX INC	18- 43	41 1/2	+ 1/2	+1.2
N	TELEX	1- 3	2	0	0.0
O	WANGCO INC	4- 9	7	+ 1/8	+1.8
O	WILTEK INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 1/2	0	0.0
A	BARRY WRIGHT	5- 7	5 1/2	+ 1/8	+2.3
O	CYBERMATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	20- 42	31	0	0.0
O	DUPLEX PRODUCTS INC	12- 25	15 3/4	+ 1/2	+3.2
N	ENNIS BUS. FORMS	5- 7	4 3/4	- 1/8	-2.5
O	GRAHAM MAGNETICS	5- 10	8 1/4	- 1/4	-2.9
O	GRAPHIC CONTROLS	8- 21	12 3/4	- 1/2	-3.7
N	3M COMPANY	43- 68	57 1/8	-2 1/8	-3.5
O	MOORE CORP LTD	39- 51	44 1/2	0	0.0
N	NASHUA CORP	9- 22	13 3/4	+1	+13.2
O	STANDARD REGISTER	11- 20	15 3/4	- 1/4	-1.5
O	TAB PRODUCTS CO	4- 8	5	0	0.0
N	UARCO	17- 24	18 1/2	- 1/2	-2.6
O	VANIER GRAPHICS CORP	4- 7	4 1/2	0	0.0
A	WABASH MAGNETICS	3- 5	4	- 1/8	-3.0
N	WALLACE BUS FORMS	15- 25	16	- 5/8	-3.7

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NEWSPAPER



CW Photo by N. French

CW in Canada

Ahearn and Soper Ltd., a Canadian-owned systems house and representative for U.S. systems and peripherals firms, displayed its minicomputer business system at the recent Canadian Computer Conference. Coverage on Pages 8, 10, 29 and 43.

End of Five-Year Battle

FCC Rule Deals Death Blow to DAA

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The Federal Communications Commission (FCC) has sounded the death knell for the Data Access Arrangement (DAA).

In a far-reaching decision that affects virtually every dial-up user with non-Bell System modems, the FCC has ruled DAA-equivalent circuitry can he built into equipment beginning in April 1976.

The ruling allows independent modem suppliers to include the equivalent network protection afforded by the DAA in their modems once the equipment has been certified by an independent testing source and registered as complying by the FCC.

The ruling culminated a five-year regulatory battle during which AT&T was continually challenged to justify the need for the DAA. The grey rectangular DAAs (or couplers, as they came to be known) were first tariffed by Bell after the Carterfone decision in 1969.

The Bell System contended DAAs were the only sure way to protect the telephone network from potentially harmful voltages and other electrical interference that might be introduced by the direct connection of non-Bell devices. But in numerous regulatory proceedings, AT&T attorneys failed to prove the threat of harm was real.

The FCC decision is believed to follow closely the certification and registration program established by the California Public Utilities Commission [CW, Oct. 29], but as of late last week the FCC had not yet issued its report and order detailing how the new program is to be administered.

The certification and registration procedures will be known as Part 68 of the FCC's rules and regulations and will be administered by the commission's Office of the Chief Engineer.

After equipment has been tested by an independent source according to parameters established in Part 68, the results will he reviewed by the FCC's laboratory in Laurel, Md.

If any questions exist, the laboratory could require the vendor to supply one of the units for testing by the technical staff. In most cases it is believed, however, the test data will be sufficient.

Greatest Impact

The greatest impact of the ruling will be on users of lower speed dial-up lines who now are required to have a telephone company DAA on each line connected to a non-Bell modem. The cost of adding circuitry similar to the DAA inside an independent modem (or terminal) is expected to be nominal.

One company that has built such integrated modems is Vadic Corp. A Vadic spokesman estimated the equivalent of a manual DAA (Bell CDT type) would add ahout $50 to the cost of a modem, wlule the equivalent of an automatic DAA (Bell CBS or CBT type) would add between $120 and $150.

It is quite probable the protective parameters spelled out by the FCC are less stringent than that included in Bell's DAAs, in which case the equivalent circuitry could he simpler and the cost lower than the Vadic estimates.

It is not yet known whether Part 68 will also require telephone company equipment to be certified and registered. Some independent technical experts have cast doubt on the ability of Bell DAAs to measure up to the test limits set by the California program.

AT&T is expected to appeal the FCC order first to the commission and then in federal court. But regulatory experts see little more than a delaying action in such moves.

The experts argue the FCC limited the

(Continued on Page 2)

Judge Slapped as IBM Writ Granted

By Edith Holmes
Of the CW Staff

NEW YORK – Agreeing with IBM that the judge hearing the government's antitrust suit against it has overstepped his procedural bounds, the Second Circuit Court of Appeals here has delivered a gloved – but public – slap to Judge David N. Edelstein and the Department of Justice.

The appellate court decision ordering the trial judge to vacate three of his rulings and orders presumably will limit the "irreparable damage" IBM counsel claims its client's defense has suffered as a result of Edelstein's actions.

But the opinion could also have the effect of extending an already lengthy trial by opening the door to numerous delaying tactics.

IBM sought relief from some of Edelstein's procedures hy petitioning the appeals court in mid-October for an unusual writ of mandamus [CW, Oct. 22]. Specifically, IBM asked the appellate court to reverse orders which prevented the defense from privately interviewing government witnesses and from making oral motions in open court during the trial.

Counsel for the corporation also requested that Edelstein be compelled to file all of the papers submitted by IBM with the clerk of the court.

The appeals court heard oral agruments from IBM and the government on the matter Oct. 22 [CW, Oct. 29] and handed down its opinion on Oct. 30.

"This is not an ordinary case and will not be an ordinary trial," Judges Leonard Moore, Ellsworth Van Graffeiland and Thomas Meskill said in their decision granting IBM's requests across the board.

Neither was the three-judge panel's ruling in favor of this particular form of relief "ordinary," according to several observers.

The appellate court noted in its 18-page decision the government had asked the judges to "discourage in the strongest possible language the filing of petitions for extraordinary relief raising issues as insubstantial as those raised in this case."

But, the judges said, they did not consider the issues "insubstantial."

While commenting they had "the greatest respect for Judge Edelstein's efforts to conduct an orderly trial" and recognized "the possibly unprecedented burdens which that case has presented," the appellate judges ruled the trial judge had acted "entirely outside the permissihle bounds" of his discretion and jurisdiction.

For this reason. the appellate court contended, the request for a writ of mandamus was appropriate, but added it did not expect to review every disputed ruling

(Continued on Page 4)

Catamore, IBM Joust in Court Over Attempt to Upset Judgment

By Molly Upton
Of the CW Staff

PROVIDENCE, R.I. – Attorneys representing Catamore Enterprises, Inc. and IBM squared off against each other before Judge Raymond J. Pettine as they presented oral arguments on IBM's motion for a judgment in favor of IBM or, alternatively, for a new trial.

Pettine now must decide whether to uphold the jury's verdict awarding Catamore $11.4 million in damages [CW, July 9] or to overturn that decision, which would free IBM from paying Catamore anything.

Either way, the next step open to the dissatisfied party would he the appeals court.

Although not presented in court, the judge also has under consideration Catamore's motions for sanction against IBM attorneys for the language in their motion [Sept. 3]. Catamore also is asking for reimhursement of trial expenses and the interest on the $11.4 million owed it hy IBM.

Calling in a new attorney, IBM was represented by Jack Brown of the Phoenix, Ariz. firm of Brown and Bain. Presenting what one observer termed a "wall of flesh," young IBM attorneys sat in the rear of the courtroom while chief counsel Nicholas deB. Katzenbach made his first appearance before the bench.

Brown's argument centered on two facets of the case: multiplicity of charges in the damages and the leniency Pettine accorded Catamore in presenting its case.

'Shocking Verdict'

Calling the verdict "shocking," Brown told Pettine the question "How could it have happened?" should be asked and

(Continued on Page 6)

CPU Duns Long for 18 Cents

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – The taxpayer wouldn't really miss it and the Internal Revenue Service (IRS) certainly didn't need it, but it was the principle of the thing, and it has now stretched out into a five-month controversy.

The taxpayer is Rep. Clarence Long (D-Md.), who refused to pay the 19 – or 18 – cents interest on a $5.48 IRS hill he had previously paid – twice.

The IRS told Long the computer was at fault, that it hadn't caught up with things. But the IRS did not explain how an interest charge had changed from 19 cents one month to 18 cents the next.

When contacted concerning IRS computer programs, spokesmen at both Philadelphia and Washington IRS headquarters refused to comment, citing the Privacy Act, even though the questions asked pertained only to technical details, not Long's return.

The only IRS comment was that "this sort of thing happens with any program occasionally. We're like any other DP shop. It's not a wholesale foul-up, just a snare in a few returns."

This return, however, helongs to a congressman who sits on the House committee which appropriates funds for IRS operations.

The congressman had made a slight error on his tax returns and received a hill for $5.48, according to Jean O'Neil, a Long aide. The bill was promptly paid.

A week later Long's tax rebate arrived and, rather than the $100 to whieh he was entitled, the check was for only $94.52, reflecting a reduction

(Continued on Page 4)

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For 'Illegal' Operating Systems

Honeywell Offers Users Software Deal

By Nancy French
Of the CW Staff

WALTHAM, Mass. – Users who bought Honeywell systems from non-Honeywell sources and who have been using the accompanying Honeywell operating systems "illegally" [CW, Aug. 6] can obtain licenses for those operating systems at a reduced price as long as they act before Dec. 31.

Provided their systems were up before Oct. 1, users running under Class II operating systems, which are no longer in development, have been offered licenses for a one-time charge of $100.

Users of Class I operating systems who began utilizing them before Oct. 1 have been offered a license for a one-time charge of $100 plus a monthly license fee starting next Jan. 1.

For example, an O/S 2000 user would be absolved of paying the standard one-time license charge but, starting Jan. 1, would be assessed a monthly license fee of $350.

The one-time license charge for O/S 2000 is $35,000; for O/S 200 it is $9,500.

The offer does not apply to systems obtained after Oct. 1, and users who are planning to buy Honeywell systems from non-Honeywell sources should be aware of the mainframer's license fees for operating systems, according to Richard R. Douglas, vice-president of data processing operations for Honeywell Information Systems.

Users who obtain used systems from Honeywell receive a license to use Honeywell operating systems as part of the lease-purchase package at no additional charge.

Honeywell announced the special offer in a letter to field personnel dated Oct. 3, and Douglas made the program public in an interview here recently.

"Software is not a reel of tape, it's a service," Douglas emphasized. "Honeywell has never sold software with equipment, because to do so would mean that customers would buy software at a specific point in time and would not be eligible for the enhancements, improvements, modifications and so forth that are provided over long-term periods."

Honeywell "treats any user who is licensed to use our software the same as a user who buys our system," he explained. These users get all documentation and all updates, he said.

Class II operating system software is "no longer actively marketed" and is licensed on the basis of a one-time charge.

Class II operating systems include the Mod 1 TR; Mod 1 MSR; O/S 200; G-400 DPS; Maps; Daps; TSPS; TSPS/Daps; G-100/200; H-400/1400; H-800/1800; Mod 4; Mod 8 and Mod 2.

Class I operating system software is still actively marketed and is being offered for license for a one-time charge plus a monthly license fee.

Class I operating systems include the O/S 2000; Gcos/62; Gcos/6000; Gcos/66; Gcos 600.6023 and 6051; Gcos/61 and Gcos/64.

FCC Deals Death Blow to Bell DAA Requirement

(Continued from Page 1)

ruling to data devices to blunt a Bell challenge, the FCC order specifically excludes PBXs and telephones pending more study.

Since data communications devices (by Bell's own admission) account for only 5% of telephone company revenues, it will be difficult for AT&T to object to the ruling on economic grounds. This fact, coupled with AT&T's failure to prove the technical need for DAAs, will make any regulatory or legal challenge to the ruling very shaky, these experts say.

Nevertheless, AT&T is expected to exhaust every avenue to delay implementation of the DAA elimination. The FCC ruling said AT&T will have to change its interconnection tariffs in time to take effect by April 1, 1976. But a delay in the start of a more liberal interconnection program is a very real possibility, regulatory experts believe.

Chairman Tells More

BOSTON – Some details relating to the Federal Communications Commission's (FCC) interconnection decision eliminating Data Access Arrangements (DAA) were revealed here last week by Richard Wiley, FCC chairman, in a speech before the annual conference of the National Association of Regulatory Utility Commissioners.

A program of certification and registration will allow the FCC to focus on the very limited portion of independent equipment which contains the protective circuitry and will reduce the time and expense associated with administering the new procedures, Wiley said.

Circuit diagrams provided to the commission staff as part of the program will be limited to protective circuits only, he said.

Anticipating comments to be received in response to the FCC ruling, Wiley said he was "very hopeful that we will be able to at last lay to rest the controversy concerning Carterfone and [equipment] competition."

A spokesman for the Independent Data Communications Manufacturers Association said that if the FCC regulations require both carrier and non-carrier equipment to be certified and registered on an equal basis, "it will be a great benefit to all users.

"It will result in technical improvements and simplified overall system reliability by removing an unnecessary cost element and by removing an unnecessary system component," the spokesman said.

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Court Panel Grants IBM Mandamus Writ

(Continued from Page 1)

during the trial in this manner.

Taking for its own many of the arguments advanced by counsel for IBM, the judges cited the government's failure to prove many of its claims, among them that "IBM was harassing our witnesses."

With regard to the restrictions Edelstein had placed on interviews with adverse witnesses, the appeals court expressed its concern that the presence of a stenographer to transcribe or of a member of opposing counsel to listen to conversations with witnesses would inhibit "the free and open discussion which IBM sought."

In addition, the judges indicated they found very disturbing the trial judge's order that he be provided with a copy of the transcripts of such interviews.

"This condition is tantamount to an insistence that the trial judge be present at every interview and thus become cognizant of each proposed witness' statements even though such witness may never be called upon to testify," the appeals court said.

The panel added, however, that "there is no question but that the trial judge did not intend adverse results to flow from his rulings . . . The record indicates he felt the establishment of formalized interview procedures would aid the court in its ultimate determination on the merits and would also insure the integrity of the trial by guarding against the exercise of undue influence upon prospective witnesses by interviewing attorneys." The appellate court simply said it disagreed with the methods chosen by Edelstein for achieving these ends.

Papers Filing Crucial

The court indicated Edelstein had also exceeded his authority by not filing certain papers submitted to him by IBM counsel on the grounds they had not been given to him at the appropriate time or with the proper accompanying documents.

"Filing at the trial court level with a view to 'making a record' is crucial because, [without] extraordinary circumstances, federal appellate courts will not consider rulings or evidence which are not part of the trial record," the judges warned.

Finally, the appeals court ruled Edelstein, who requires most motions be put in writing, will have to hear such normal motions as objections to the admission of testimony or exhibits and motions to strike certain testimony when these are advanced orally in open court.

Noting that "the burden of hearing oral motions may prove onerous and even distracting during the course of a lengthy trial," the judges said such motions were nonetheless "obviously necessary to expedite the trial."

While the appellate court said it saw no reason why IBM's papers charging certain government attorneys with misconduct should not be filed as the government's charges have been, it told the parties they could ask Edelstein to keep the documents under seal. The judges reiterated their understanding that Edelstein intends to hold a hearing in this matter.

Neither the trial judge nor the Department of Justice has made any public comment on the appeals court decision. That decision can be appealed to the Supreme Court under some circumstances or can be reheard by the full nine-judge panel of the Second Circuit Court under other conditions, but the government has not yet decided whether it will seek either remedy.

The long-term effects of the appeals court decision are difficult to perceive, observers agreed; there seem to be several possibilities.

Certainly Edelstein will be forced to toe a more rigid line than that to which he has been accustomed. If he is successful in following the dictates of the appeals court and IBM loses the case in the district court, an appeal by the defense on procedural grounds might actually be weakened, the observers said.

For its part, IBM counsel is now in a better position to employ the full range of weapons in its legal arsenal. The behavior of the defense in the past indicates it will surely use every means available to it, one observer remarked.

The Justice Department appears to be least directly affected by the decision. But, another observer noted, "it will be more difficult for the judge to shield the government's case from attacks by IBM, if that was ever his intention."

Still another commented on the lack of preparation and persuasion in the government's oral arguments on behalf of the judge before the appeals court.

"I hope the Justice Department does a better job in presenting its case in the district court," he said.

CPU Duns Rep. Long for 18 Cents

(Continued from Page 1)

of the $5.48. This meant the IRS had collected twice for the same payment, O'Neil said.

Long then called the IRS, which told him to stop payment on his check. Shortly thereafter he received another bill for $5.48, this time with a $5 fine for stopping payment tacked on.

Yet another phone conversation with the IRS assured the congressman the fine would be waived. This conversation was followed by the receipt of an IRS check for $5.48 in the middle of June.

Then a phone call from the IRS advised Long not to cash the check, but to hold on to it until he received still another bill and to return the two together.

On Aug. 25 a bill arrived for $5.48, plus the $5 fine, plus .19 cents interest. A subsequent September bill eliminated the fine, but charged only 18 cents interest.

"We think the matter is finally cleared up," O'Neil said, "but that doesn't mean that we won't be getting another bill in the next few days."

Long has stated that, if the bill had been for $16 or $160, he couldn't have taken the risk of fighting the IRS because he undoubtedly would have been accused of trying to get out of something politically.

"We have found other cases, checking back over the last six months' worth of casework, where the problem was clearly a computer error," O'Neil asserted. "A programmer is fouling up somewhere."

Long said he has been able to convince IRS officials that if its computers make a mistake, taxpayers should not be penalized.

And to highlight his point, Long is drafting a bill, the Taxpayer's Bill of Rights, to correct what he calls the "double standard" of charging taxpayers interest on money owed the government, but paying taxpayers no interest on amounts "overwithheld" from their salaries and later refunded.

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Contenders for Seattle Contract Knock Each Other Out

Special to Computerworld

SEATTLE – Two contenders fighting for a facilities management (FM) contract effectively knocked each other out when the City Council here rejected both bids after several rounds of charges and countercharges.

The first blow was struck when Boeing Computer Services (BCS), a local firm, took "strong exception" in August to the mayor's recommendation that the city award a contract for converting from an in-house to an FM operation to Computer Sciences Corp. (CSC), headquartered in California.

BCS requested "an immediate and full disclosure of the evaluation and selection process" in a letter to the city in September.

The city wanted to award the five-year, $15.9 million contract to CSC because its proposal "was rated best technically and [it] was the low bidder," according to John Elliott, assistant budget director for management information systems for the city.

The BCS position was "more critical than it should have been in the heat of disappointment," he said.

BCS, however, charged the city made a $1 million arithmetic error in evaluating its bid and leaked information from the BCS proposal to CSC.

Data From BCS

While a CSC vice-president, Vincent Grillo, admitted his company had received information about the BCS bid, he said that information had come not from the city, but from a BCS sales employee, William Beagles.

Beagles had divulged the information over "several rounds of drinks" in a local restaurant, Grillo said.

According to the city's law department, this leak was passed on to the mayor's office by former Sen. Martin Durkin, now acting as the local counsel for CSC, in the form of a memo with derogatory comments on the BCS proposal.

This information was brought out during testimony before the City Council, which held hearings as a necessary preliminary to a final decision on the mayor's recommendation.

During the hearings, Grillo charged "BCS has deliberately introduced the appearance of evil into the process to either delay or destroy this FM procurement."

Although Beagles admitted to the meeting in the restaurant, he told the council "nothing privileged was discussed."

Elliott claimed he knew of no instance of BCS proposal information being available to CSC and said that even if it was, it wouldn't have mattered since CSC submitted its full proposal a month before BCS did.

Both Bids Rejected

At the time BCS was informed of the apparent CSC victory, an offer was made to BCS to give it a bidders' debriefing on the evaluation and selection process, and weighting factors were released to both bidders following the formal bid opening last June, Elliot said.

After several weeks of City Council hearings, both bids were rejected due to "flaws in the competitive bidding process" and "attempts to influence city evaluators improperly."

The flaws, according to the law department, were a failure to publish an official notice requesting bids when a change of the original request for proposal was made and a lack of specifications in the city's request, which meant the two competitors were not bidding on the same project.

The "attempts to influence evaluators" charge referred to the apparent leak of the BCS proposal by Beagles.

BCS and CSC have collided previously over public sector contracts, Elliott contended, citing examples in nearby Pierce County and Newark, N.J., where BCS protested CSC contract wins.

"The protest of the selection and attempt to discredit the evaluation have become the hallmark of BCS' reaction to losing FM contracts," he said.

Once the controversy started with the City Council hearings, politicians began questioning whether a change in the current DP operations should be made at all.

"There is a cloud hanging over the bidding process and the evaluation," City Councilman Tim Hill, chairman of the hearings, said.

"Unless this can be cleared away, the council will have no other choice than to reject the bids and start all over," he added.

One of the "starting-all-over" options, Hill indicated, was giving up on FM and returning to a city- or county-managed DP center.

The city is now left with the options of examining the possibility of a joint city-and-county-managed facility, continuing with a city-managed operation or starting over from the beginning on an FM procurement.

Econometricians Share Nobel

WASHINGTON, D.C. – Two econometricians – a Russian and a naturalized U.S. citizen – who pioneered the use of computers in solving economic problems have been jointly awarded the Nobel Prize in economics.

The Swedish Royal Academy of Sciences tapped Yale University Prof. Tjallings C. Koopmans and Leonid V. Kantorovich "for their contribution to the theory of optimum allocation of resources."

Kantorovich, who holds three orders of Lenin, was one of the first to apply computerized mathematics to Soviet economic problems.

Koopmans, born in The Netherlands, came to the U.S. in 1940 and is one of the originators of econometrics.

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Catamore, IBM Lawyers Joust in Court

(Continued from Page 1)

squarely faced. Brown's answer was that, through a series of convolutions, the case confused the jury.

Each time Pettine ruled straightforwardly, Thomas K. Christo, the attorney for Catamore, convoluted the issue, he said.

Using quotes from Pettine during the trial, Brown observed Pettine had warned Christo of the latitude granted him to tie issues together.

Brown charged items were not tied together. "The verdict is in error and is dead wrong. It should not be allowed to stand," he said.

Focusing on the issue of unrealized business as claimed by Catamore because of DP deficiencies, Brown attacked the profit projections, including new business ventures, presented by Catamore President Robert Catanzaro.

He called these unprofessional, and unreliable, being handwritten and of a general nature, which only occasionally took into account cash flow and financing.

Testimony indicated, he said, the projections were not used by Catamore, but were discarded.

Much of the Catamore trial focused on the admission of oral agreements between Catamore and IBM for systems engineering (SE) work. These were allowed as they were ruled separate and distinct to the written agreements for machine services.

Brown took issue with this ruling and also focused attention on the wording of an IBM letter telling customers they would be charged for SE services in the future. He stressed the wording made it clear the ultimate responsibility rested with the customer.

Rather than the $26 million figure indicated by Catamore in an exhibit, Brown said the maximum that could be awarded would be $6.2 million. A $12.5 million figure presented by Catamore was gross profits, included duplication of charges and "does not have the dignity to be considered by court, let alone jury," Brown said.

The result of the "profusion of confusion" presented the jury was that it "doubled what could have been perceived on any claims," Brown said.

It was "a general verdict, and one cannot factor out what a jury did wrong," he said. "The entire verdict is tainted by confusion [and] wrought by defendant overreaching," about which Pettine had warned, he said.

Brown implored Pettine not to take "the easy way out" and let the case go to the court of appeals, but to overturn the verdict.

"An important part of the responsibility of a judge is to judge the rightness of the verdict," he told Pettine, who "understands the extent of his latitude led to this unfortunate verdict."

Negligence Enough

Christo, responding, observed Brown's argument ignored the issues of fraud and negligence. "Even accepting all of his argument, negligence alone would support this verdict," he said.

Several matters on which Catamore had argued negligence, such as improper machine selection and lack of warning to the customer regarding the dangers in switching to an inventory system, were mentioned by Christo.

Turning to Brown's argument about damages, Christo argued the total "only came into play if the jury awarded punitive damages." He said his presentation made very clear there were duplicative items, which were there to demonstrate the different theories of liability.

"For compensatory damages we were very clear," he said, observing IBM had never previously made this objection.

"The jury could have chosen from available documents," he said, adding even an IBM witness had estimated $19 million as the bottom line for the elements Catamore claimed.

Considering the care taken in presenting the judge's charge to the jury compiled from the two attorney's charges, the length of the deliberation and the number of questions the jury asked, Christo said he felt the jury knew what it was doing.

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For Successful POS Implementation

Properly Prepare Customers, Employees for Scanning

By Nancy French
Of the CW Staff

TORONTO – Scanning terminals, the Universal Product Code (UPC) and an end to price marking can be successfully implemented if both customers and employees are properly prepared for the change, attendees at the Canadian Computer Conference were told here recently.

The advice came from Arnold M. Sobrian, coordinator of Project Point-of-Sale (POS) for Steinberg's Ltd., one of Canada's largest supermarket chains and the only one to implement a UPC scanning installation in this nation to date.

Last week's 18-month progress report emphasized that, while a lot has been accomplished, there is still a long way to go. Right now, a major problem is the fact that many food packagers have not yet begun to include UPC symbols on their products, he said.

Steinberg's installed an IBM 3660 system consisting of Model 3663 scanning terminals, with individual control units and a 32K 3651 minicomputer. Data gathered during the day's operation is retrieved each evening via auto call and processed on a 370/145.

CW In Canada

Rather than an over-the-weekend conversion, Steinberg's eased customers into the new system over a two-month period, Sobrian explained. As a first step, only two automated checkout lanes were opened. Standard mechanical cash registers were retained in the other lanes.

During this period, bag stuffers were distributed to customers explaining the benefits of the new system, he said.

Customers were and still are provided with grease pencils at the entrance of the store to mark prices on the items they select, if they wish, he said.

But few are bothering to do so because they have confidence in the scanning mechanism. They've tried it, and it works, Sobrian indicated.

As part of their introduction to the scanning machines and an end to price marking, shoppers were invited to scan some items themselves on a scanning device set up in a booth at the back of the store, he said. A store employee was stationed there to explain the advantages of the system.



CW Photo by N. French

Arnold M. Sobrian

After one month of partial automation, the entire store was converted. By the end of the second month, price marking was discontinued.

By the time the store was fully converted, few shoppers expressed dissatisfaction with the system, and sales figures indicated few discontinued shopping at Steinberg's in favor of competitors that have yet to automate, he indicated.

"Active employee participation in every stage of the [system's] installation" was also a key factor in making the new operation a success, Sobrian said.

In the planning stage, employees were briefed on system objectives, he said.

Store employees also helped formulate operational procedures and design supporting equipment.

Labor Relations

Employees' unions were notified in advance during the course of decision making, and educational sessions were held for union representatives, Sobrian said.

Even now, however, after 18 months of operation, the system has not brought about cost savings or gains in productivity expected for several reasons, but it is coming, he said.

We found the most significant improvement in productivity occurred where 70% to 80% of products being checked contained the UPC code, he explained.

However, since only 45% of Canadian products are marked, this necessitates costly symbol marking of 35% of the store's merchandise with Toledo printers, he said.

Further, checkers have been slower than expected in attaining promised speeds.

"But the equipment works and very reliably," he said, adding that in 3,500 hours of operation, the store in Dorval had only two hours of downtime.

When the controller in the store does go down, the store manager restores service by tying his checkstands into a controller at another supermarket 350 miles away.

With it, the new system has brought increased accuracy.

Up-to-date item-movement information through telecommunication linkups provided by the system offers the advantage of better and quicker reordering and avoidance of "stock-outs," he said.

More efficient price monitoring and general control by headquarters ensures matters of chain policy are followed, he said. This assures that local store customers get the benefit of nationally advertised sales.

Once employees are relieved of the need to price mark store items, they can place more emphasis on shelf marking, which actually provides far more information than the price marking on the item itself, he said.

In addition, more detailed information on the customer cash tape will enable more effective handling of customer claims and discrepancies, a benefit to both the supermarket and the customer, he said.

Finally, control of pilferage through comparison of items sold with items moved is certainly another advantage.

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DBA Job Too Big for One Person; Team Concept Urged

By Nancy French
Of the CW Staff

TORONTO – Data base administration is too big a job for one person – the team approach makes more sense, A.H. Cassidy, senior data base administrator (DBA) for the University of Toronto, told the recent Canadian Computer Conference here.

While the specific functions performed by the DBA vary from installation to installation, the DBA is ultimately responsible for the "now-recognized resource of data," he said.

The DBA must perform maintenance of the physical data base data sets, including backups, physical reorganization and relocation of the data base, definitions and the data dictionary, if one exists, he said.

The DBA also controls the security system and monitors and tunes overall system performance.

Finally, he often consults and advises others on data base and program design and training of programming staff.

"Such a pivotal function must be adequately staffed," Cassidy said. Management must avoid the temptation to do the job "on the cheap" and turn the DBA function into a one-man show.

In the earlier stages of an installation's development, the DBA function can be split among existing organizational units, Cassidy suggested.

"This works well with systems in the batch-only stage," he said, "since the number of central functions is small and can be handled by existing personnel."

But with the addition of teleprocessing, with its inherent security problems, the need for a central coordinating function increases "drastically."

The best approach is the formation of a DBA group, consisting of the DBA and staff to carry out the necessary functions. This is the most effective option but often is not attempted because of a perceived high cost, he explained.

The DBA function at the University of Toronto, evolved over a five-year period, Cassidy said.

At first, the DBA function was split between the software section and the managers and supervisors of the various project teams.

Toward the end of the batch-only period, when some systems were developing teleprocessing applications, some of the problems associated with central needs began to be felt, he said, and the assistant to the director became involved in a coordinating, quasi-DBA role.

As teleprocessing applications became operational, however, the department was reorganized and three positions were established – one senior DBA plus one technical specialist in student information and another in business affairs information.

Although the two "junior" DBAs do not report to the senior DBA, they work in concert.

The two junior DBAs took on all the DBA tasks formerly executed by the managers and the supervisors: the senior DBA coordinates and carries out certain "central" tasks. The entire DBA group meets on a weekly basis to discuss matters of general concern, he said.

CW
In Canada

University Adds 'Door' To Make IMS Secure

TORONTO – The standard security provision available with IBM's IMS, although probably adequate for most endeavors, lacks a fine detail necessary in the university environment, A.H. Cassidy, senior data base administrator for the University of Toronto, told the Canadian Computer Conference here recently.

Standard security usually permits access for inquiry or update at the data item level so that if a particular user is to be permitted access to a data item, such as student's course mark, that user is effectively permitted to access all occurrences of that data item – all student course marks, whether or not the students are his.

In IMS, security can be compared to a series of "doors" which must be opened in order for the user to have access to the data, he said.

Some doors are physical, such as the security keylock on the terminal, while others are unlocked via predetermined procedures.

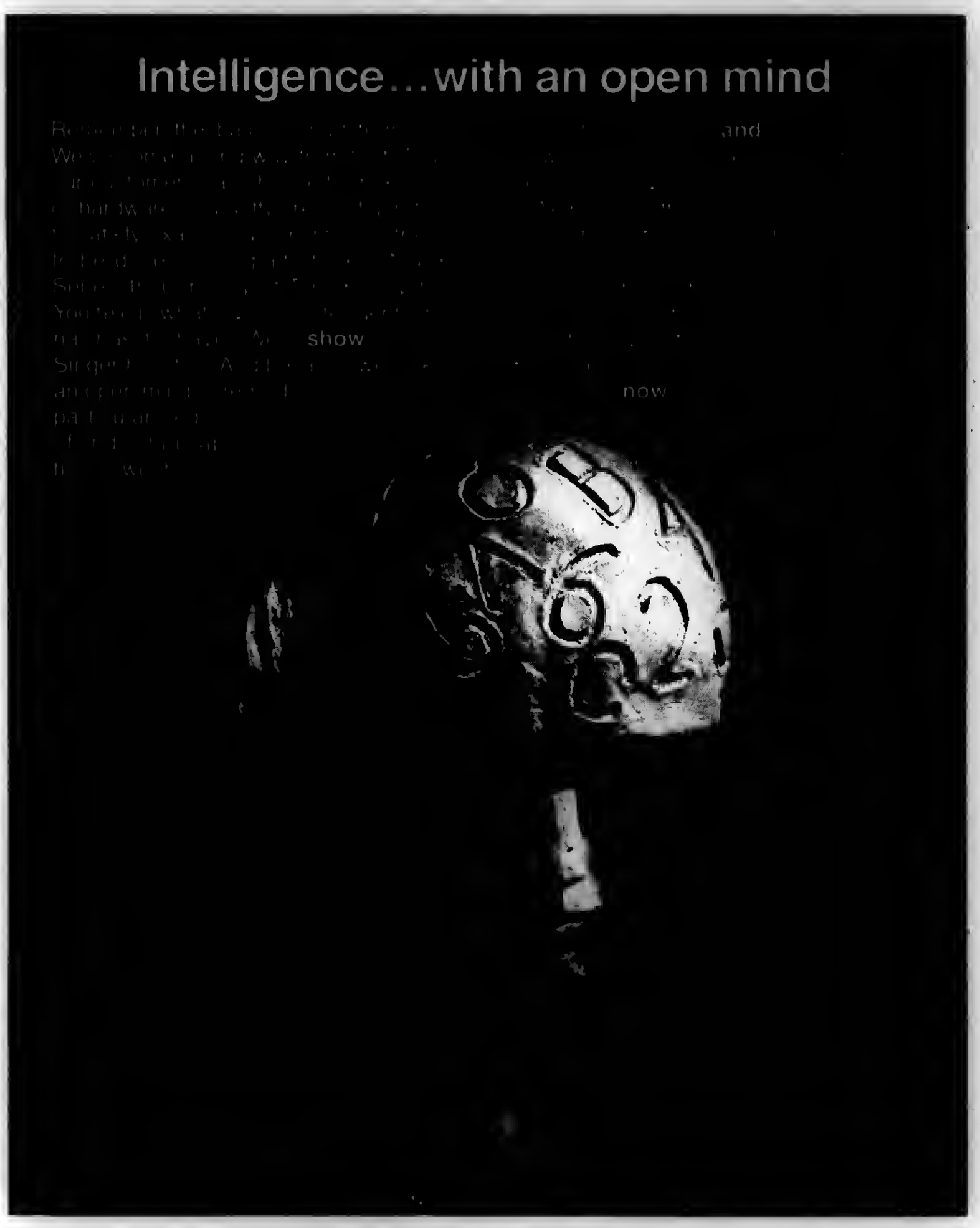
Security at the date item occurence level can only be implemented within a particular application because of the complexity of the security policy.

To fill this need, the University of Toronto decided to add another "door" to the security scheme and provide whatever central services were possible to aid each application group in implementing this kind of security, he said.

The central components included a security data base to serve as a repository for the application-oriented data and parts of the teleprocessing interface routines to access and store that data, he said.

The application system manager, working under an established policy, determines the data to be recorded for each logical terminal and communicates this via the DBAs terminal to the master terminal operator, who records it on the security data base.

Simultaneously, a security check routine is installed in the appropriate programs. At the time of the input transaction, the security information is accessed by the teleprocessing interface and provided to the user program, which uses the application's security check routine to determine whether this transaction should be passed or not.



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To Make Intelligent, Informed Decisions

Congressmen Finding Data-Accessing Techniques Vital

By Nancy Freneh
Of the CW Staff

WASHINGTON, D.C. – According to columnist Art Buchwald, senators and representatives decide whether to vote yea or nay on a bill by reading *The Washington Post*.

Other observers here contend it's a congressman's aide who clues him in.

Computers At Work In Government

Whomever one chooses to believe, it is clear the lawmaker who tries to stay abreast of today's critical issues in enough depth to make an intelligent, informed decision is faced with a full-time research job.

The average congressman has suffered from the same myths and misconceptions about computers that plague John Q. Public. While the Executive branch – for which Congress is mandated to "check" and "balance" – has amassed some 7,000 computer systems for use in decision-making as well as administrative chores, the House, Senate, Library of Congress and Government Printing Office have only seven systems altogether. Information gathering here is done through the traditional hearings process and written reports.

The General Accounting Office, the arm of Congress responsible for overseeing the operation of the Executive branch, doesn't even have a computer. It chooses instead to piggyback service when time is available on Capitol Hill systems.

Recently, however, led by North Carolina Rep. Charles Rose, a second-term Democrat, congressmen are being pushed into the computer age to help manage the information explosion that has made their jobs so difficult.

Clerk Allowanees

Rose, who learned the value of computers in the North Carolina state government's Department of Administration, where he used them to help prepare the state budget, is convinced the information explosion can be managed with the application of computer power.

As chairman of the House Administration Committee's Ad Hoc Computer Subcommittee, established last March, Rose recommended members of Congress be given the option of spending up to $1,000 from their clerk-hire allowance each month for computer services. The Senate purchased 100 terminals for whoever wanted one.

Although reluctant at first, now more than 40 representatives and 70 senators have CRTs and printer terminals installed in their offices to take advantage of the computerized information provided free by the Library of Congress' Information Systems Office (ISO).

Some are even subscribing to information services offered by the *New York Times*, Lockheed's Computerized Information Retrieval System and Systems Development Corp., according to Neal Gregory, executive director of the ad hoc subcommittee.

Since a terminal rents for about $200/mo and the Library of Congress' computerized information system, known as Scorpio, is free to members of Congress, sufficient funds remain to subscribe to outside information services which range in price from $25- to $125/hour, he added.

But Congress' old ways of doing things can't be wiped out all at once, according to Rose. Instead "you have to waltz in slowly," develop a track record and win its trust.

Congress is now developing several computer systems of its own for three key functions: basic information retrieval, such as bill status; constituent services and word-processing functions; and federal budget monitoring and control, Gregory said.

The new budget committees and the House Budget Office, created by the Impoundment Budget and Control Act, are all getting heavily involved with computer systems. They are adapting executive department data bases for their own needs as well as contracting for outside econometric modeling services from organizations such as Chase Econometrics, Data Resources, Inc. and the Wharton School, he added.

Already in operation in the House is a financial management system, run on an IBM 370/145, to handle payroll for the 698 separate employers – members and committees – on Capitol Hill. It also updates bill status on a daily basis.

Last year, the House put into operation an Electronic Voting System to record the entire House vote without the need for a time-consuming formal roll call.

Driven by two Control Data Corp. 1700s, the system incorporates voting stations that identify each member by his perforated identification card and provide buttons by which he may vote yea or nay after being identified by the system..

It also features a scoreboard and two terminals so clerks can get a breakdown by party, geographic area or other category.

Budget System

Still under development is a Budget Information System that will be made available to members in a kind of "situation room" at the Capitol.

According to Gregory, this system, which is patterned after the one used by the legislature in the state of Washington, would make budget proposals made by specific pieces of legislation available in the form of charts, graphs and other easy-to-digest formats.

If a legislator wants to know the trend of expenditures for medical assistance, for example, he can obtain figures on past expenditures as well as future projections from budget data in the situation room, Rose explained.

Once a good system of data information is developed, "chairmen of appropriations committees will no longer be able to tell members that such-and-such amendment will have far-reaching effects that cannot be readily determined. Members will be able to find out for themselves," Rose said.

Some day, Congress will be able to monitor expenditures made in Executive departments to assure instant accountability, he contended.

Every time an Executive computer writes a check, congressional computers would be notified, he said.

With these kind of checks and balances, Congress will always know what the Executive branch is doing with the "taxpayers' dollars."

Library of Congress Operating Seven Data Bases

WASHINGTON, D.C. – The Library of Congress' Information Systems Office (ISO) is operating no fewer than seven data bases that provide information on-line under the curious name of Subject-Content-Oriented Retriever for Processing Information On-Line (Scorpio).

Of these data bases, the three most important are the Major Issues File and two separate Legislative Information Files – one for the 93rd and a second for the 94th Congress, according to Neal Gregory, executive director of the House Administration Committee's Ad Hoc Subcommittee on Computers.

Using a custom-designed, English-like vocabulary of four-letter words, members can retrieve from the Major Issues File a 10-page brief on any one of nearly 200 topics ranging from abortion and aging to waste disposal and world population control, Gregory explained.

The file also contains a list of any hearings on each subject as well as all pending legislation and any data on the matter available through the Library of Congress, he added.

The Legislative Information File gives a congressman or member of his staff a digest of each bill plus a 100-word factual description of it and the date it was introduced on the floor.

Also available are names of sponsors, what committee has been assigned responsibility for a bill and its status.

Legislative information is available on-line within 36 to 48 hours after action since its source is the *Congressional Record*, which itself lags Congress by 24 hours, Gregory explained.

The fourth data base is the National Referral Center Resources File, which contains 10,000 descriptions of organizations qualified and willing to answer questions or provide information on science, technology and social science issues.

For example, "if you key in the word 'refugees,' one can find six different organizations that can give expert information on refugee problems," Gregory said.

Fifth is a Selected Science and Technology Reference File which consists of a bibliography of 90,000 references in science, technology and library science from the Library of Congress catalog.

Sixth is the Bibliography Citation File, a list of articles from significant periodicals and pamphlets, Congressional Research Service reports and similar materials which are also available in hard copy from the library.

The ISO requires the power of two 370/158s, one dedicated to batch processing and the second to teleprocessing functions, to service Scorpio, the library and Congress' other cataloging needs.

According to Bill Nugent, assistant director for information systems development, the systems use 40 spindles of mixed-vendor, 3330-type disks, containing 500M bytes of storage.

Audri Planned for Drug Overdoses

PASADENA, Calif. – The automated drug identification system (Audri), developed at the California Institute of Technology under government contract, is planned to meet the growing challenge of treating those endangered by drug overdose.

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County Punches In-House, Processes at Private Site

By Nancy French
Of the CW Staff

GRAND RAPIDS, Minn. – With too low a daily processing volume to justify its own system and the nearest service bureau 80 miles away, Itasca County officials found themselves in a bind when Carlton County could no longer accommodate their DP needs on its system.

Computers At Work In Government

Itasca County solved the problem with a little help from Blandin Paper Co. here, according to Robert Loscheider, Itasca County auditor. The solution, he said, was to bring job setup and keypunching in-house and buy computer time from Blandin.

Still working this way five years later, the operation has been so successful four other nearby counties have also singed on with Blandin, and all are patterning their systems after the one Itasca developed.

Itasca's data processing activity is not only rather novel for a government operation, it is also very low-budget, according to Loscheider.

Itasca's data processing budget for 1974 totaled $42,500. This included salaries paid to one programmer, one full-time keypunch operator and one half-time keypunch operator.

The $42,500 figure also included funds for paper supplies and 15 hour/mo for computer time by the clock. Cost per capita for Itasca's 38,000 residents was $1.12, Loscheider said.

Four Functions Automated

The county has computerized four principal functions: accounts payable, payroll, the highway department's road and vehicle costs and real estate taxes for 16 cities, 41 organized townships, 38 unorganized townships and five school districts, Loscheider said.

Programmer Linda Taylor, who heads the data processing effort, writes all code, sets up daily jobstreams, supervises the keypunch operators and distributes all reports after processing.

In addition to her responsibilities for Itasca County, she oversees data preparation for Chipawa and Yellow Medicine counties, both just beginning to computerize.

The tax program is one big file-editing problem, according to Taylor. "We load all market values, land splits, sales and changes in name and address of landowners for each assessment district all year long."

Then, once a year, "we calculate taxes on the computer." This information is used to "compile a taxbook for county officials as well as printing tax statements for each parcel listed," she said.

Taxpayers get two statements – the first on May 31 and a second on Oct. 31.

As receipts trickle in, they are posted and taken in for processing daily, she said.

In addition, about 10 different tax data abstracts are prepared for the state.

Payroll and accounts payable are run every two weeks.

Recent changes in the state's tax laws have radically altered the way taxes are calculated, and many of the existing programs have to be totally rewritten this year, Taylor said.

In particular, the "circuit breaker" which links the amount of real estate taxes an individual pays to income has added greatly to the tax collection workload, Loscheider explained.

All processing is done in batch mode on Blandin's IBM 370/125 at a cost to the county of $130/hour. Turnaround time is generally 24 hours, according to Doug Englehart, Blandin's DP manager.

The $130/hour rate includes time, hardware, the operating system, an operator and disk space for files and programs, he said.

Englehart was quick to explain, however, that Blandin is "not in the service bureau business" as such. "We're just trying to cover some of our overhead," he said.

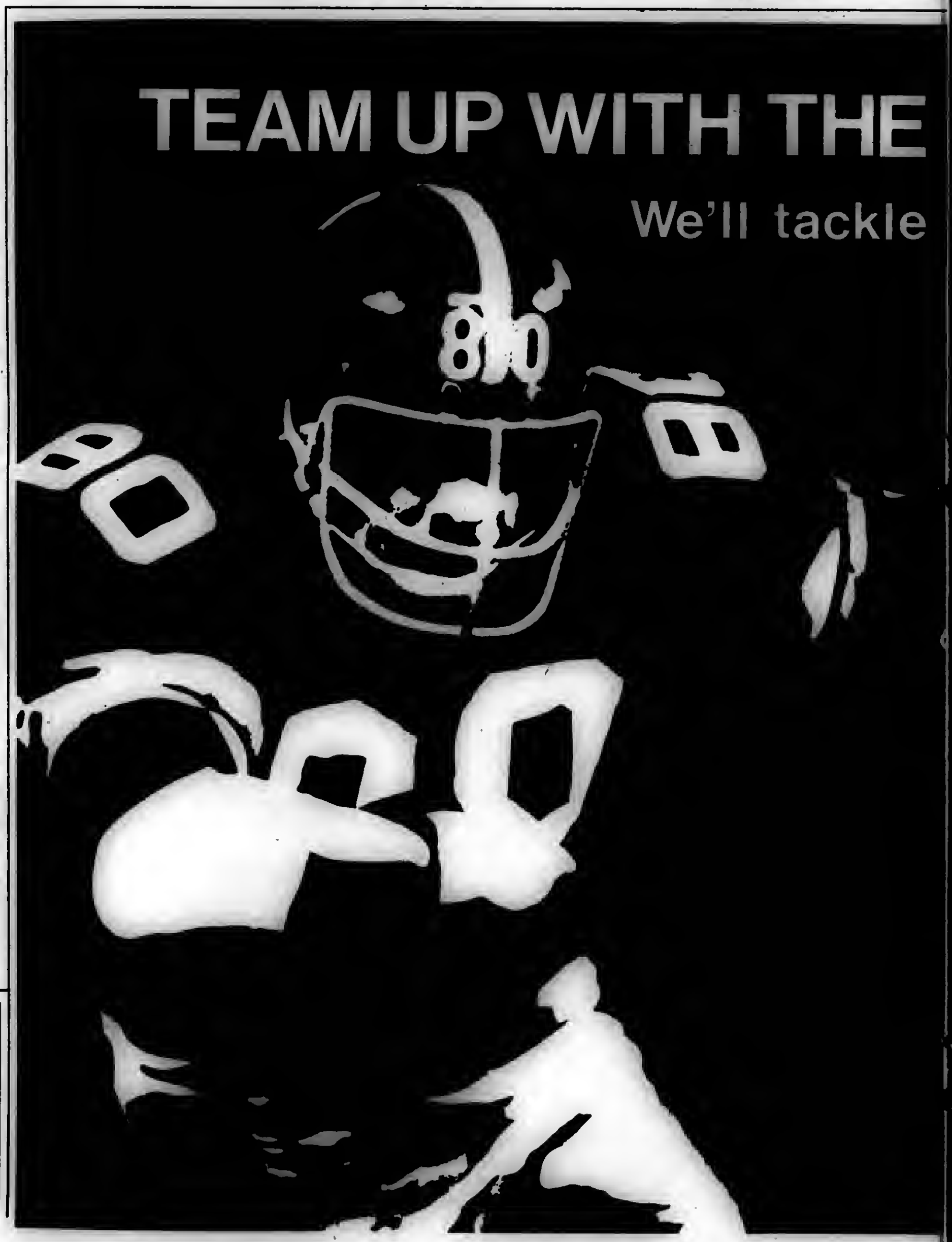
"If we were in the service bureau business we couldn't afford to offer these rates," he said. On the other hand, however, "if we didn't do this, we probably couldn't afford the computer we have either."

The 125 has a 162K CPU and 70M bytes of disk storage.

Like Blandin, Itasca County has adopted PL/I as its programming language. This has permitted the county to take advantage of many of the library routines Blandin is using at no extra cost, Englehart noted.

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For County Tax Purposes

System Maintains Assessment/Market Value Ratio

By Nancy French
Of the CW Staff

NORRISTOWN, Pa. – The Montgomery County Board of Assessment has developed a system here to keep the assessment of all residential properties in the county at a rate constantly proportional with their market value at any given time.

Computers At Work In Government

The system is geared to eliminating the need for regular physical reassessment, as well as making property taxes as fair and equitable as possible, William Wentz, Assessment Board chairman, said.

At the moment, since the county is in the process of selecting and installing a new central computer system, this program is being processed on Honeywell equipment by Worlco Computers, Inc., a nearby service bureau, he said.

The master file, on the other hand, is being maintained temporarily on an IBM 370/125 at Montgomery County Community College, Wentz said.

All administrative updates, such as changes in ownership as well as improvements and additions, some of which are based on building permit information, are furnished to the service bureau where they are keypunched and stored on magnetic tape.

Once a month these tapes are sent to the community college DP department where they are changed from 7-track to 9-track format and added to the master file, which is stored on disk for access through CRT terminals at the Assessment Office.

The master file contains about 165,000 residential properties, which are accessible by parcel number or by recorded deed book and page number, Wentz said. Each record contains the owner's name and home address as well as details about the property such as the amount of living space in square feet, number of bathrooms and garages and number of stories, as well as assessed valuation and market value at the time of the last assessment, he said.

To keep assessment value up to date, "we look at all sales of comparable property and adjust the value attached to the various characteristics of a property in line with the new sale prices," DP Manager Don Cunningham said.

The goal is to keep the ratio between the assessed value and the market value of all properties in the county at 33.3%, John Deitch, Wentz's assistant, said. At the moment, "our average is down around 19% or 20% because of inflation and the fact that some properties haven't been reassessed in some time, he said. One final countywide assessment will be needed before the system is adopted.

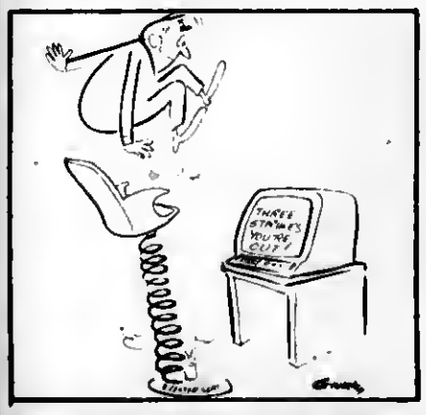
This unique system was designed here after county officials, "scouring the country" for a suitable system, came up with nothing they could adapt to their needs.

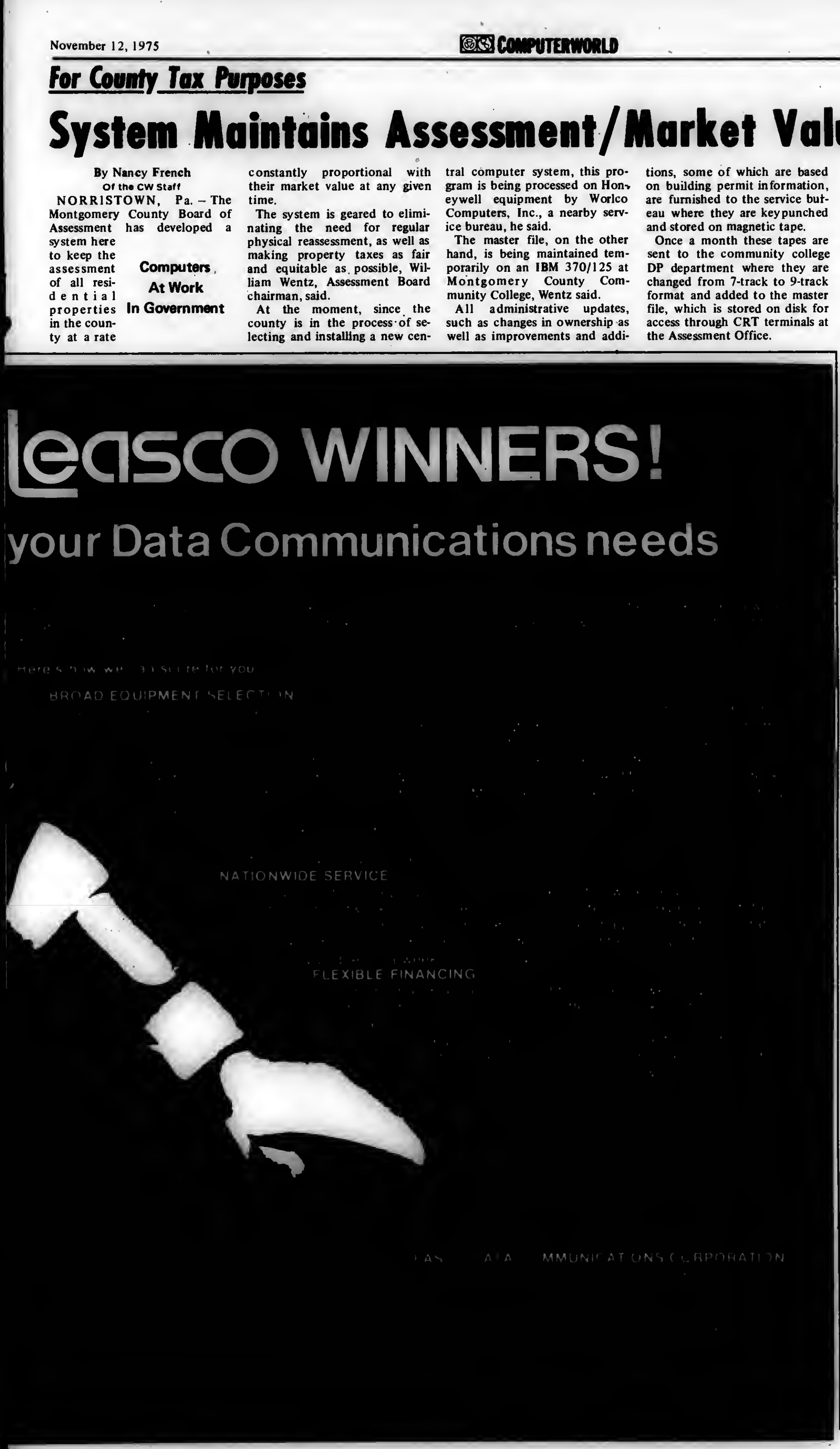
"Most places are using fancy statistical programs such as multiple regression analysis that ordinary citizens and most of the users, in fact, can't even understand," Wentz said.

When it is installed, the entire system will be maintained in an on-line interactive environment, and all administrative changes as well as massaging will be done via the CRTs in the Assessment Office.

The county is just in the development stages of bringing up a similar system to handle commercial and industrial property.

The programs are all written in Cobol, the language adopted by the county for all its DP activities, Cunningham said.





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Editorials

Bridging the Gap

The Association for Computing Machinery is to be congratulated for an ACM '75 program appealing to a wide membership.

In addition to technical sessions attended by standing-room-only crowds, the conference also forged ahead with the theme "the quality of life," offering several sessions that focused on the contributions computer professionals can make toward that goal.

ACM is to be lauded for its efforts to get membership to look at issues that are not industry specific, although the adage, "you can lead a horse to water, but you can't make him drink," seemed to hold true.

The sessions on computers in electoral voting, public policy and such were there, but were sparsely attended.

One item that perhaps highlighted most poignantly what might be interpreted as the self-imposed isolation of the DP community occurred at an ACM first – an evening entertainment hour.

At SigElbow cocktail hour, an improvisational group performed skits which either used input from the audience or were created by the troupe and reflected the public view of computing.

Although nearly all scenes drew hearty laughs and applause, it was nevertheless evident there is a gap between the general public – the performers – and the DP community.

The troupe managed to throw out a few buzz words and to incorporate some audience themes into skits, but their representations of DP situations or future everyday life as influenced by DP were often rudimentary.

The audience laughed at this different level of understanding almost as often as at good lines. Some of the skits could have been hilarious if the troupe had hit the mark more often using "in" remarks in appropriate situations.

But the fact the audience could appreciate the chasm between the entertainers and itself confirmed the belief that the DP community will recognize the gulf and build a bridge.

Perhaps focusing on specific areas where DP expertise is needed in the public domain, such as at the sessions on the quality of life, would be a good place to start.

Through the skit ACM leadership may have found a medium for its message to members more effective than the "public interest" sessions alone. Perhaps next year there will be more interest in such sessions.

Privacy Act Abuse

It seems some government agencies are trying to use the recently enacted Privacy Act of 1974 as an excuse to withhold information from private citizens and the press.

Computerworld recently contacted the Internal Revenue Service (IRS) in connection with the investigation of an article. The information requested pertained strictly to technical matters, specifically computer programs of the IRS, not to the tax returns of any individual.

The IRS, however, said any disclosure of this type of information would violate the Privacy Act.

However, the IRS was in fact violating the Freedom of Information Act.

If official agencies are indeed going to use the Privacy Act as a scapegoat or as an excuse to conceal unconfidential information, the industry and citizens alike may have to ride herd on the interpretation of the act.



'Don't Look Now, But I Think You're Also Being Followed.'

Letters to the Editor

Negative Editorial Policy on IBM Tends to Destroy CW Credibility

Computerworld's completely negative editorial policy toward IBM, coupled with its prejudiced reporting on IBM matters, tends to discredit all of its other articles and certainly destroys much of its credibility for accuracy.

Why doesn't CW smarten up?! IBM isn't all bad. Sure, any large company has faults, but it has made a tremendous contribution to our field, and everybody in the trade knows that.

William E. Berry
Montvale, N.J.

Responsible Analysis Wanted

I'm beginning to think a newspaper which adopts the tabloid format evolves to a like mentality after reviewing *Computerworld*'s issue of Oct. 15.

The lead story ["IBM Planning Attack on Antitrust Judge?"] as well as the first-page coverage [Course of Telex vs. IBM Shaped by Personalities] establish my case. What is clear is that IBM has submitted an appeal document and it is likely in connection with Judge David N. Edelstein's denial of IBM's request for preinterview.

To speculate that this is an "attack" and "as some rumors seem to indicate, the firm may well ask for his removal" is contrived journalism.

As for the Telex vs. IBM material, CW's position becomes clear in explaining that the appeals court decision was a function of "rolling out ex-Attorney General Nicholas P. Katzenbach to make a presentation to the judges, several of whom were appointed while he was in the Justice Department."

As a user manager who has installed a fair number of competitor's computing systems, I know full well the intensity and near intimidation of *the* computer company. To this end I expect, from the weekly issue, responsible analysis of key management, hardware, software and communications issues.

It serves no useful purpose for CW to compromise the essential reporting in the above-mentioned areas with the notions of its editorial staff.

David W. Delaney
Germantown, Md.

No Problems With Hardware

In the letter from Ed Tunstall [CW, Oct. 15], it was difficult to get a real feeling for his problems.

We installed a Hewlett-Packard 2000F time-sharing system June 1, 1972 (about 29,764 hours ago). All downtime comes to about 185 hours – preventive maintenance (about five hours every three months) 70 hours, power failures 15 hours and hardware and software problems about 100 hours.

Our system runs 24 hour/day, seven day/week. Our single biggest problem is the aging of lamps used for position control in the disk drives. They need to be replaced every nine to 12 months. Otherwise, the system just runs and runs and runs.

Oh yes, our console running 24 hour/day has given a few problems. When this occurs, we simply plug in a terminal to use until the console is repaired. We once ran for two days without a console.

Our service comes from Atlanta, Ga., about three hours away. This does not bother us either. We once thought about an uninterruptible power supply when power failures were occurring every 15 minutes. However, our only problem with power failures is the slow system clock.

All of us take the system for granted. Most of our users don't know what the terms "system down" or "crash" mean.

Fred W. Stone
Manager, Computer Center
School of Engineering
Tuskegee Institute, Ala.

NCR's Newer Equipment Improved

Having been a user of NCR equipment for over five years, I feel Ed Tunstall's letter was pretty harsh, and I hope its effects will help to gain better support in his area.

His equipment was first released by NCR in 1968. Since that time NCR has released newer and better versions of processors and peripherals.

We originally installed a Century 100 and, although we didn't experience one-quarter of the problems Tunstall has experienced, we have found that since our upgrade to the Century 101 we have experienced only one major problem on this system. This amounted to downtime of only one day in a two-year period.

To express our confidence in NCR and its hardware, we have just recently purchased our system due to the expansion capabilities now offered with the C-101.

I sympathize with Tunstall because, during my past 12 years in the DP field, I have experienced similar problems while working with IBM hardware.

J.E. Leeson
Lansdale, Pa.

(Other letters on Pages 16, 17 and 20.)

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Letters to the Editor

Personal Experience Insignificant Sample

As a woman and DP professional for eight years, I strongly object to the ideas expressed in the commentary irritatingly headlined "Women Don't Want Promotions" [CW, Oct. 15].

Wolfe's first point was women don't make as much as men since their length of service is shorter than men's. As proof he cited his own personal observation of the species, "women programmers." This is an excellent example of how deep-rooted stereotypes of women are.

As a professional in a statistical field, Wolfe must know that any sample drawn from his personal experience is not statistically significant when dealing with the large population of women in DP.

As for women's reasons for leaving jobs, I have known men who quit for every one of his reasons (except maternity, of course).

Wolfe's next point was most women don't want to be promoted to managerial positions because of the added demands on their time. Again we are offered only Wolfe's experience to back up this contention.

Pretending to know the motivation of a whole class of people, as Wolfe did, is only a facile rationale for excluding that class from consideration when promoting. If this isn't discrimination, what is?

Wolfe's last point that fewer women than men apply for programming positions was inconclusive. What is of interest is how the ratio of men to women changes when progressing from job applicant to employee hired to employee promoted. This is the statistic that must be carefully examined.

Wolfe tried to dismiss charges of discrimination by appealing to the very stereotypes that cause it. I'm afraid he's part of the problem.

Carol Christiaanse
New York, N.Y.

Same Applies to Males

In Jack M. Wolfe's commentary, "Women Don't Want Promotions," I was surprised to find that age-old reference to women (who have) "resigned when their husbands' employment changed to another city," forgetting that in all probability the husband resigned at one company to accept that position with another company in another city.

Another age-old reference was to women's maternity leaves where, again, no comparison is made to the typical "lost days" of the male employee.

Further, one wonders which statistics Wolfe used when he made statements such as, "The average period of employment of women programmers is noticeably less than that of the men." All of the evidence I have seen pointed to the contrary, and even *Computerworld* reported in the same issue ["Management Problems Promoting Women Self-Imposed"] "statistics from the Department of Labor showing the average length of service by women is comparable to that of men."

Barbara McLean
Los Angeles, Calif.

Left Out!

After worthless delays and a very clear indication of low-priority regard, the Ford administration finally named a gaggle of second-rate bankers, plastic-money executives, and root cellar professors to the EFTS commission. Electronic Funds Transfer, when it gets really rolling – and you can bet your privacy the Big Buck Boys will see that it does – will consume 'way over a billion dollars worth of computers and data communications gear and hundreds of millions of dollars worth of hardware and software security packages. So naturally, not one single person with even the very faintest hint of technical knowledge was named. Considering that Ford's predecessor, the lamentable King Richard, put the boots to his own science adviser, I support we shouldn't be surprised. But gee! I would have been happy to have even had the manager of the Grand Rapids IBM office on the commission. True, he would have outranked most of the other appointees, but better a Friendly Local Salesman than a deputy – *deputy*, yet – New Jersey banking commissioner.

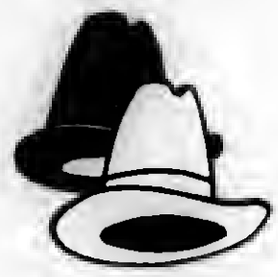
Here everyone clearly recognizes the beginnings of the most dangerous embodiment of 1984: a worldwide net of financial transaction records that will enable the block-by-block, minute-by-minute surveillance of every credit-happy American. Even the notorious Republican indifference to consumer protection might have been expected to waver a little in the face of such a Frankenstein monster! Putting aside human rights as being unrewarding in an ITT society, and loathing Nadcrites with a passion, one would nevertheless have expected Ford at least to appoint a couple of Uncle Toms; Dick Simpson types abound in today's Washington. But no – one hundred percent grinders of the public face!

But surely even *bankers* know about embezzlement? A wide-flung money net offers the most unbelieveable opportunities for incursions – doesn't anyone want an expert? Oh, I know; get Donn Parker to testify and manipulate his warnings as appears most economically and politically astute at the moment. But this is not a minor little system that can be revised in a few months after the first scandals.

My own idea would be to pit the greedy electronics men against the greedy bankers and the antediluvian lawyers; they will want layer upon layer of expensive security and, with some part of their product in place, a later generation of outraged consumers – our present one is too numbed – can set up privacy devices quite easily. First, you need locks; you can change the combination and restrict access later.

Given time, we might have got a good scrap going between the department stores, the banks, the Federal Reserve, the plastic-money menaces, the Ross Perots trying to set up fresh networks, the ITTs and RTWs, and giant IBM. While the monsters battled for the consumer's carcass, we might have arranged, if not an escape, at least private burial. Alas! Too late!

Probably we can look to a few of the states for help; Democratic or populist or just plan cantankerous – hello, Governor Brown – they still offer some regulatory protection. The state civil liberties outfits offer some regulatory protection. The state civil liberties outfits ought to forget the other kind of capital punishment and get to work.



Herb Grosch

Credit-Card Crediting Method Can Penalize Customer

The Taylor Report
By
Alan Taylor, CDP



A Richmond, Va., reader recently had a problem with his credit account with Sears Roebuck and Co. He discovered a system flaw, in that the company bills using descriptive billing on a monthly statement, giving the customer about three weeks to pay without incurring a finance charge. So far, so good.

But, he pointed out, it took him six weeks to even get an answer to an inquiry through normal channels and, in the meantime, he was assessed a finance charge.

This reader has other problems with the answer, so I won't go into the details of his case this time, except to point out that he has put his finger on a system flaw that lies at the heart of many computer billing systems – the concept that a credit is simply a reverse debit. It may have been at one time, but it certainly isn't so now.

Finance Charge Changes

The major changed circumstance that has stopped the mirrored-debit credit systems approach having validity is, as the reader pointed out, the finance-charging methods that have been recently introduced almost everywhere throughout North America.

Until recently, the finance charge was based upon one single parameter such as the average daily balance or the balance outstanding at the end of a cycle.

Items did not attract finance charges until they were billed and time had been given for collection.

It wasn't a simple system to handle, but at least it could be handled. Crediting interest as well as original charges was computable just from the credit memo. Now it isn't.

Under the currrent system, it is difficult to compute interest refunds. Under the new system, finance charges are assessed differently for purchase made, billed and in their first collection period, depending upon some outside factor. Normally the selected factor is whether any balance existed at the previous due date, but others are used.

Two Categories

From this point, customers are separated into two categories, first-class customers who had no outstanding balance and second-class customers who had some outstanding balance – even if it was only a few cents. Second-class customers are charged finance charges based upon longer time periods (say from billing date or even from original charge date) than first-class customers.

For instance, someone may be charged for a wall mirror and a round-trip ticket at $120 in Month 1, then issued a credit memo for $60 when half the ticket is not used. If the credit is not reported to the system before the due date, from Month 2 onward, that customer will become a second-class customer for all purchases, not just for the $60 lost credit.

At first sight it would appear the second-class category would vanish when the delayed credit appears. But that doesn't always happen, as the wife of another reader, Professor Albert S. Dexter of British Columbia and McGill Universities, found out.

In her case, the $60 refund was issued in April, but didn't find its way into her charge account with the Royal Bank of Canada until August.

But the real danger turned up in September, when the system not only continued to charge the interest payments for the intervening months, but also started charging interest upon the interest. (The Dexters had carefully cleared their account month by month except for the delayed refund and the appropriate interest charges.)

In short, as the system stands today, a delayed credit can put a customer into a permanent second-class category, unless he elects to pay finance charges he shouldn't have been charged in the first place.

Airline Chaos

In talking to the Royal Bank about Professor Dexter's case, I found, not to my surprise, the airline industry is a particular problem with regard to late credits.

Not that it appears to be deliberate – apparently their systems are so fouled up the bank finds charges made in its own Montreal head offices (where some airlines have rented space) taking months to return to the charge systems.

What did surprise me however was they had come up with a solution to the problem of getting credits promptly into the hands of the customer, although at the moment it is operating only with a single airline, Air Canada.

Air Canada, instead of issuing a credit memo to a charge customer, now gives him a check made out to the Royal Bank for the amount. It's that simple. The check is restricted to the Royal Bank itself, and, of course, can be used to pay off the monthly statement of the original charge when it comes.

The system works for the bank, the credit-card company, the airline and the customer. And it does the required job of handling credits on a priority basis, so the system flaw in current mirrored-debit credit treatments is avoided. Congratulations, Air Canada and Royal Bank for a good bit of initiative.

But is still doesn't solve the general problem of credit handling when the refund is delayed over two periods.

As far as I can see, to really compute these charges backwards, the account has to be recomputed item by item, payment by payment, billing date by billing date to find out the proper finance charges.

Yet I don't think such detailed reconstructions are either being performed or are justified. So, who has solution? Should the restricted-check system become a general one? Is there any other way of automatically handling credits other than by the mirrored-debit systems? I'd like to know if there is one that fits current finance-charging practice.

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Use of Assembly Line Concept Can Speed System Development

By Edward R. Zujko
Special to Computerworld

In today's rapidly changing business climate, users cannot just sit and wait for two or three years for a new system. If a system is worth developing, then it should be done now.

But the Systems Department uses essentially the same approach it used 20 years ago and, if anything, development time has grown even longer. It's time for Systems to review its own procedures and to develop better methods for statisfying users' requirements.

Today's system is developed in much the same way Swiss watchmakers used in making handcrafted watches over 100 years ago. The senior analyst carefully studies every aspect of the new system and oversees every detail of its development. Apprentices learn the trade by working under the senior's direction. The finished product is a monument to the analyst's skill and workmanship.

Well, today's watches are produced on an assembly line much faster and better than ever before. Similar improvements can be made in the Systems function!

The assembly line concept can be applied to any task that can be divided into smaller, less complicated ones. To this division, standards must be introduced so the pieces can be fit back together easily. If that can be done, then the individual tasks can be farmed out and worked on simultaneously.

In Systems, the design of input requirements, file specifications, manual procedures, operating specifications, control procedures and daily, weekly and monthly reports are all tasks that can be performed simultaneously as soon as the main design has been selected. Similarly, other individuals can take over and work on the programming, testing or implementation stages.

As a result, all available manpower resources can be assigned to one project and the development time can be telescoped into a four- to six-month period.

Other Advantages

There are many other advantages to be achieved by changing the workflow:

- Increased productivity would result from standardization and variety in work assignments.
- A dynamic and stimulating working environment would be created.
- This would provide an excellent environment for training and development.
- It reduces the risks associated with dependence on key people.
- The chances of specification changes in midstream are reduced.
- The manager has better control of costs and schedules.

The transition to an all-out effort on one system at a time can be accomplished smoothly. Progressively bigger teams can be assigned to new projects and responsibility for major segments of the system can be assigned to different individuals. At the same time, the due data can be advanced.

The real test will come when it's time to make the final decision. Systems people have become quite skilled at overcoming resistance to change. Will they be able to work the same magic on themselves?

Zujko is DP manager at Green Giant of Canada.

Reader Commentary

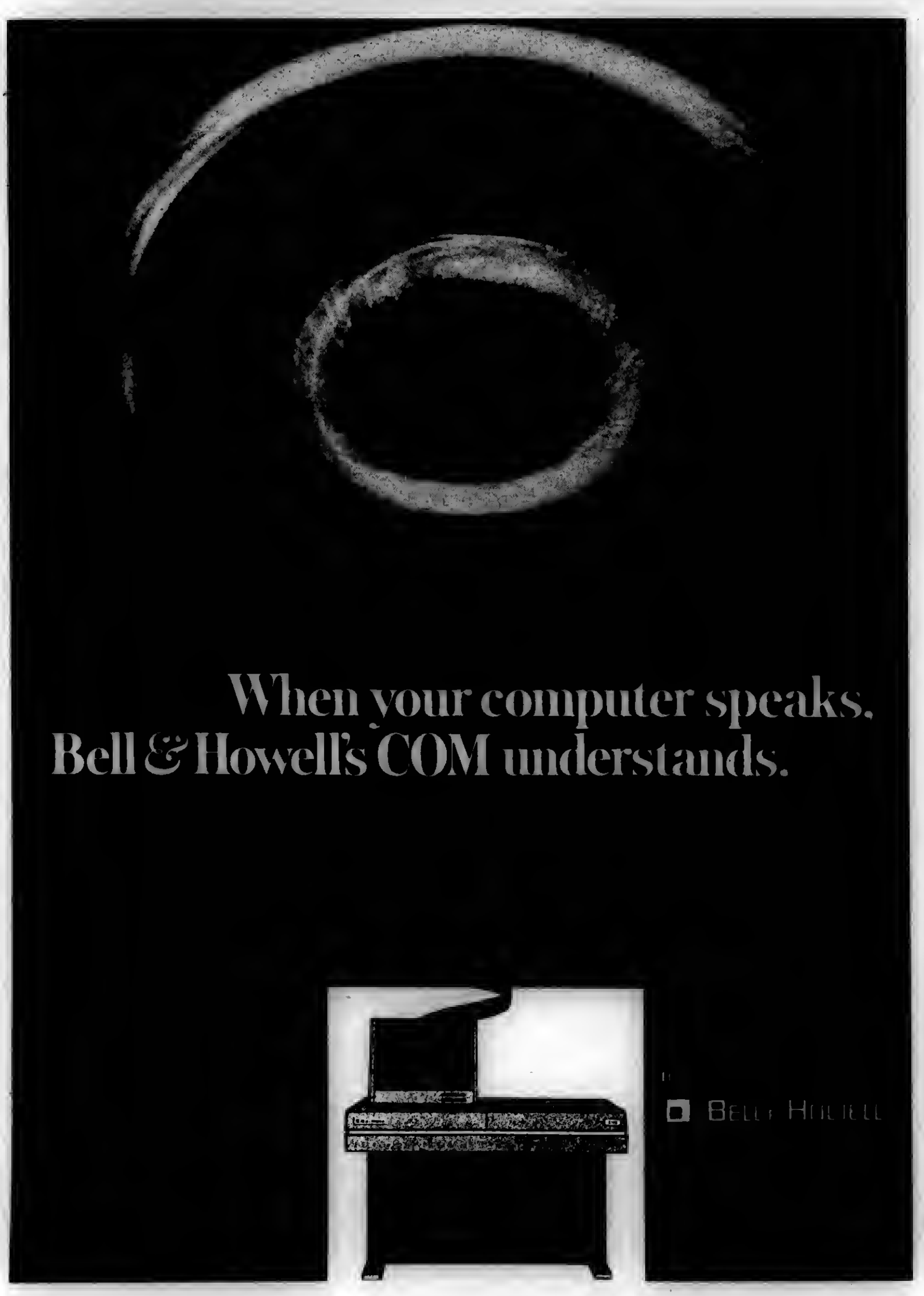
Letters to the Editor

Report on DBMS Available

In the Special Report on data base management systems [CW, Sept. 24], Don Leavitt referred to the National Computing Centre publication *Data Base Management Systems: User Experience in the U.S.*

Readers may be interested to know this report can now be obtained in the U.S. from Hayden Book Co., Inc., 50 Essex St., Rochelle Park, N.J. 07662.

Brian Davis
National Computing Centre Ltd.
Manchester, England



Letters to the Editor

Times Project Addendum

Having seen a continuing stream of letters concerning the New York Times Information Bank project, I would like to try to resolve some of the confusion.

Much of it began in the June 4 *Computerworld* article, "Rules Not Helpful All The Time," in which CW innocently attributed some of my remarks in a National Computer Conference panel discussion to Prof. Peter J. Denning (who, to the best of my recollection, expressed no opinions whatsoever on the aforementioned project).

Subsequent to that article, there have been angry letters from F.T. Baker of IBM [CW, Aug. 13] and Stanley Kaplan, Harvey Morgenstern and Bob Blumfeld of the *New York Times* [CW, Sept. 17 – not to mention a rash of private correspondence and phone calls in which everyone tried to figure out who said what to whom.

Kaplan, Morgenstern and Blumfeld had a valid point in their letter: Since I had not worked on the project, I should not have made any public comments concerning it. To the extent that I may have distorted the situation or insulted either the developers or the maintainers of the system, I certainly apologize; to the extent that CW further garbled the situation by associating the remarks to Denning, I think some apologies are in order.

However, I think the incident should be viewed in a different light. Everyone is interested in the *New York Times* project, since it appears to be a "classic" case study of successful use of top-down implementation, chief programmer teams and structured programming.

Shortly after publication of Baker's initial paper on the project ("Chief Programmer Team Management of Production Programming," *IBM Systems Journal*, January 1972), I began hearing grumblings that the users had not received the system they wanted; later on, there were even suggestions that IBM had failed to deliver the system it promised.

I have not been in a position to substantiate these third-hand rumors,

However, in early 1975 I began hearing rumors that the code itself was rotten. A telephone conversation with the maintenance manager of the *Times* project provided me with the following information:

- Despite its use of structured programming, the code was difficult to understand and modify.
- There were serious efficiency problems, partly because several functions were duplicated and were executed redundantly in a sequence of off-line batch programs.
- Some modifications were difficult to make because modules were highly coupled together.

This is not to suggest the code was bad – although the *Times* programmers are obviously in a better position to judge than we outsiders. I certainly think the code is better than that which would have been produced using "classical" techniques: on the other hand, it does seem that the system probably did not make much formal use of the techniques of "structured design" described by Myers, Stevens and Constantine in the May 1974 *IBM Systems Journal*.

Edward Yourdon

New York, N.Y.

A clarification of "who said what to whom" appeared in the July 16 issue of *Computerworld*. Ed.

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Getting your data from here to there

A special supplement on Data Communications Network Configurations in the November 26th issue of Computerworld.

You can run into a lot of hangups planning and operating a data communications network. Your DP staff - including managers and technical specialists - has to make important decisions on a lot of expensive items like terminals, line speeds, modems and network configurations, to name a few. These networks are usually planned years in advance, and when they are put together, they're built to last. Yet the industry is in a constant state of change, and networks are often being upgraded with faster equipment, newer sites, more efficient lines, etc. So proper planning is essential.

We'll be taking an in-depth look at the changing world of data communications networks in the November 26th issue of *Computerworld*. And we'll give special emphasis to how they should be planned. Edited by Ron Frank, this supplement will be filled with input from users who understand this environment with all its implications, and you'll get the benefit of their experiences. You'll see stories that evaluate common uses of data communications, like batch versus on-line, private lines versus dial-up lines, all-digital versus analog lines, and the use of newly emerging carriers. And you'll see stories that point out ways you can get the least cost on your configurations.

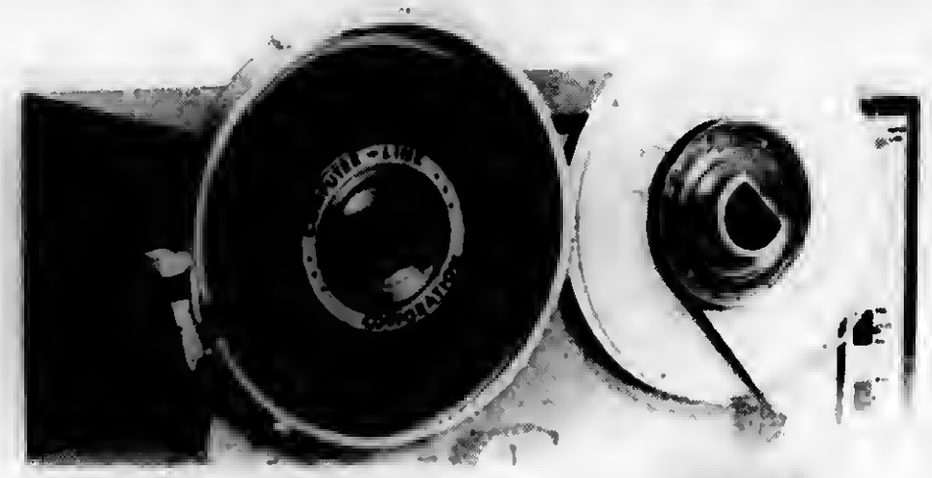
If you're involved with data communications - or if you will be in the future - you should be reading this special supplement in the November 26th issue of *Computerworld*. And if you're marketing data communications products or services, you should advertise them here. But don't miss the November 7th ad closing date. Contact your area *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Programmer Mystique Can Enhance Professional Image

By Jerrold Asher
Special to Computerworld

Almost daily we hear a plaintive cry for more profcssional recognition of programmers. The most recent was recorded in a computer trade book article comparing programmers to physicians and lawyers as co-professionals.

Programmers seeking respect by associating their art with that of doctors and attorneys overlook one simple fact – human life and personal property are two of man's dearest possessions. We are quite willing to pay whatever price the seller of protection services charges.

We stand in awe of whatever mysterious alchemy that protector practices on behalf of our preservation. We maintain our admiration even when it often turns out the practiced skill is no more than a simple ability to compare our symptoms or situations with others found in reference texts. (Computers are used to perform this function in medicine and law. Are they professionals, too?)

I quite agree with my fellow programmers that our services are equally dear to businessmen. Unfortunately, the businessmen do not see it our way. They see a physician saving their personal being, the attorney saving their corporate being – but what kind of savior is a programmer?

Freedom of Spirit

Furthermore, programmers seek respect on the one hand while condoning freedom of spirit on the other. The two don't mix. Ever see a doctor or a lawyer greet clients in peace beads and sandals? Or arrive at a client's place of business on a Honda 440?

Programmers should be aware of the extensive regimentation and formality used in training physicians and attorneys – all of which is carried into their professional practices.

Doctors wear lab coats. Lawyers go before robed judges in conservative business suits and ties.

Doctors are never addressed by their given names and never their surname unaccompanied by "Doctor." Lawyers bury every major or minor proceeding in pounds of documentation – all too long (14 in.) to fit a standard business file – written in obscure terms only they can interpret. Again, this is a form of regimentation used to make us civilians aware of the presence of a true professional.

Programmer Mystique

What programmers must recognize is the use of symbols and trappings by the respected professionals. Programmers need to make use of their own panoply of mystique to enhance their professional image. Certainly the terminology is there. We can trap any businessman in the bits, baud and byte routine. Perhaps a little more formality or some form of uniformity in personal appearance would also help.

What is almost imperative is a stronger public relations effort to convince businessmen (who pay for our services) how invaluable, necessary and precious our "professional" services are. One suggestion is that articles, news releases and stories on computer applications be written with emphasis on how computers have become the survival kits for business in the ever-intensifying competitive struggle.

Let us show and tell how measurable dollar savings were made, personnel saved, information brought forth which was not otherwise available. Writers should stay away from showing the relative low cost and ease with which needed programs are generated. More dear-to-life pricelessness and product previousness for programming should be underscored.

Another item programmers overlook in their striving for professional recognition – professionals never never undercut each other's prices. Physicians do not compete on price.

They belong to a very tight society called the American Medical Association which helps them set price schedules jointly. It then rules that such schedules are absolutely fair when we civilians have a complaint.

The attorneys do much the same. If you doubt this, try shopping around on the cost of a standard legal procedure such as drawing a will or probating an estate.

Programmers do not consult on price schedules. They bid either what they feel the traffic will bear (successful practioners) or whatever it takes to get the job (newcomers to the field). No wonder businessmen treat us like a pack of rabble, playing one against another.

Programmers must band together when it comes pricing time. As Benjamin Franklin so deftly put it: "We must all hang together else each hang separately." What we need is a joint

(Continued on Page 20)

Reader Commentary



Policies Written for Precomputer Age

Companies Often Not Insured for DP-Related Risks

By Roy N. Freed
Special to Computerworld

Have you ever read an insurance policy to see whether your company had adequate protection with respect to its involvement with computers? You ought to try it some time — when you're in a very expansive mood.

I've had a number of occasions to do it recently, for different types of companies, and find it to be a challenging experience — to say the least.

Those companies included a systems house supplying hardware procured in the OEM market and its own application programs; a supplier of software programs alone; and a commercial time-sharing system operator. Note that the last company has potential exposure as a user as well as a supplier.

How would you go about the project? I tried to start simply by reading the policies. The difficulties of that approach quickly showed me the better way.

From a Legal Viewpoint

My effort to apply the provisions to a client's operations — more specifically, to its activities fraught with risks of loss to itself and harm to its customers and to complete outsiders — convinced me I had better take time off first to catalog those risks.

Thus far, very few people seem to have been ready, willing or able to analyze activities of companies involved with computer technology and come up with a good list of the types of risk exposure they face — and those few do not seem to include insurance specialists. It's a difficult, time-consuming task that, unfortunately, appears also to be essentially a negative exercise.

Cushion for Catastrope

Actually, the analysis of types of risk exposure has very positive qualities because it provides the only sound basis on which to plan a proper insurance program that will provide a cushion against a number of potential financial catastrophes.

Many companies do not yet have those cushions and are unnecessarily vulnerable where insurance is available at reasonable cost. Risk exposure analysis also is the foundation for a risk exclusion program for limiting exposures by appropriate provisions in agreements.

To start things off, I decided I would try to make up a list of general types of risks. I recognized I probably could not complete the task myself, but I could make a good start and pave the way for its completion by personnel of my clients.

My contribution was to identify the potential broad areas of exposure to insurable risks, based on my general legal sensitivity.

These areas of exposure include, for example, bodily injury to people and damage to property that might be suffered by so-called third persons if a computer-controlled industrial process runs amok; harm to professional reputation or exposure to the fallout of a malpractice charge if an engineer is furnished with erroneous computations for use in his practice; and loss imposed on customers in ordinary businesses if data bases or software program data in the supplier's computer are destroyed or if programs, whether used remotely in that computer or on-site in the customer's computer, are erroneous, to name only a few horrors.

Note the variety of legal categories involved. They include negligence, products liability, harm to professional reputation, loss of property and breach of contract. They also might include libel or slander.

The list should really be more detailed and complete, but even this sketchiness provides enough material for policy analysis, namely the specific types of coverage for which to look.

The first thing that will strike you in studying insurance policies is the fact that the traditional policies all were written for a precomputer society. They talk in terms of tangible personal property and physical products. Products are insured only after they leave the possession of the supplier.

All in all, policies raise almost more questions than they answer. They reveal many risks are not insured.

Myopic Companies

Essentially, we are confronted with the need for policies that

(Continued on Page 20)

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Insurance Policies Expose Firms to DP-Related Risk

(Continued from Page 19)
are designed with computer technology expressly in mind. When will insurance companies rise to the occasion?

To indicate the myopia of some insurance companies, let me review an experience I had at a recent conference. An insurance specialist gave a seminar on insurance needs in the computer industry. He treated risks involving hardware, media, and service bureau operations and spoke of property, valuable papers, business interruption and errors and omissions coverages.

I asked about coverages for software suppliers whose programs might cause an industrial process or medical use to go awry. He couldn't picture those possibilities, being oriented only to business data processing.

After much nagging on my part, he went back to the office and tried to draft a new type of policy to cover those risks, but all he could picture still were business data processing mishaps.

Insurance underwriters, like many other professionals, must become more sophisticated respecting computer-communications technology.

How do we contribute to that sophistication and start to get insurance coverages needed by many types of computer industry suppliers? By starting to analyze risks of businesses and then reading insurance policies.

Policies must be read closely, much as one would read documentation of a software program. The coverage needed must be provided for clearly and positively. It must not be excluded either categorically or by a restricted definition.

A limitation to tangible personal property might exclude a customer's data base stored in a supplier's computer or software programs, which probably will be defined as information-processing processes – and hence intangible personal property – for many legal purposes. We need a cadre of people who can do a professional job in this important area.

Incidentally, we'll be playing this "tangible"-"intangible" game repeatedly in this column. The concept crops up in taxation, product liability, antitrust and many other legal areas.

Parting Shot

Just a parting shot to put something in your bag of tricks. It is possible to buy property insurance to cover replacement cost, rather than actual value after depreciation.

But the higher coverage is enjoyed only if the lost property is actually replaced. But replaced with what? The same thing? Or a more advanced item with greater capability or capacity?

This is an important question in light of the great dynamics of computer technology. As critical as it is, the word "replace" is not defined in the policies I have examined.

Get its meaning clarified by having the insurance company or broker write you a definition – and do so well in advance of suffering a loss.

In another column, I will treat the matter of indemnification commitments extracted, in supply contracts, from either the supplier or the customer. These are useful measures that are similar to insurance contracts in effect, so long as the indemnitor has the financial resources to back up its commitment.

There are many performance evaluation tools... How do you decide which to use first?

It doesn't require a lot of money or complicated techniques to get started. The table at the right provides a good common sense approach.

Look at the bottom two rows. It is easy to see why over 400 computer installations are already using the Johnson Job Accounting Report System as the cornerstone of their performance evaluation programs. If you are a cost conscious manager, who must get the largest improvement for the minimum expenditure of dollars, job accounting has to be your first choice.

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Mystique Can Help Enhance Image Of Programmers as Professionals

(Continued from Page 18)
committee on pricing. This committee could establish suggested prices for applications programs, operating systems, I/O drivers, utilities, new language programs, communications handlers. It could also establish suggested hourly rates for time and materials programmers based on experience – just as medical or legal specialists are 'allowed' to charge higher fees than general practitioners.

More professional emphasis is definitely in order for programmers. A little more regimentation, formality, better public relations and collusion in pricing, and the professional status will follow automatically – just as it has for physicians and attorneys.

Asher is director of marketing with Telos Computing, Inc. in Santa Monica, Calif.

Letters to the Editor

Literature Needed On Cobol Debugging

I would like to respond to Kenneth Morris' "Debugging Help Asked" [CW, Oct. 15]. I believe there is a noticeable absence of literature which addresses procedures for debugging from only core dumps.

A primary reason for this, I feel, is this approach to debugging requires knowledge of certain areas which may not be attributed to the Cobol programmer. This includes fluency with BAL to interpret at least the instruction which caused the exception and an understanding of the organization of the object module that has been formatted by the Cobol compiler so key areas of core (DTFs, IOAREAS, WORKING-STORAGE, TGT, PGT, etc.) may be located and identified in a timely fashion.

Additionally, it requires a healthy understanding of LIOCS which would assist in the interpretation of the contents of DTFs and IOAREAS, which, in turn, is important to identify where in the processing the exception occurred.

I would be interested in reader response to the question – would there exist a market for such a document – "Debugging From Core Only" – among Cobol programmers?

Roger Poole
Danbury, Conn.

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Problem-Solving Style Imposed

'Domain-Specific' Languages Would Help: Hammer

By Molly Upton
Of the CW Staff

MINNEAPOLIS – "Restriction and discipline are worth one heck of a lot," Michael Hammer, assistant professor at MIT, told the ACM '75 session on programming language theory recently.

Speaking on "The Design of Usable Programming Languages," Hammer advocated the use of "domain-specific" languages.

In particular, Hammer said that by appropriately limiting the programmer's freedom of choice, the number of decisions he must make are reduced and he can concentrate on the application area itself.

"Most people would rather be told where to start," he said. Languages should be designed for individual problem areas and each language should be built around a style of problem solving, an algorithmic structure appropriate to its application domain.

Such a language should include a style of problem solving and programming that forces the programmer to use a particular methodology and style of writing, he said.

"The fabric of the language will be woven around the problem domain," he explained.

"If the programming language embodies the structure, learning the language is equivalent to learning to write programs," he remarked. This had been true of several languages, such as RPG; GPSS, used in simulation; Planner, an artificial intelligence language; and BDL, a business DP language he has worked on.

For instance, there is some truth in the axiom, "Once you've seen one RPG program, you've seen them all," he added.

"Most languages are afflicted with the problem of too much generality," he said, citing the first of his irregular rules: "A language that is equally good for everything is equally bad for everything." In other words, if it doesn't force the programmer into certain structures, it doesn't help him.

The second of his rules is that Basic – "fill in your favorite language" – is not an easy language. For instance, although Basic makes it easy to write statements, this is not true about the overall construction of the program, he said.

Declarative Programming

Hammer advocated the declarative programming approach which incorporates an algorithmic organization into a programming language and provides descriptions of the result of a computation rather than explicit instructions to a processor.

"Our fundamental attitude is that a user understands the data with which he is concerned, and the manipulations which are to be performed on this data, and even how these manipulations are to be organized – provided this organization is expressed in terms of the data," he said.

Techniques Hammer advocated included the use of problem-oriented, implicit control structures; declarative, data-driven programs, and data flow specifications of where the data is going instead of how it gets there.

One problem is how to recover acceptable performance from this type of programming. He dismissed as a solution the idea that hardware will speed up, thus eliminating the problem.

Although these types of programs have been shown to be up to five times as slow as others, however, the cost of writing the program is increasingly overshadowing the cost of running the programs, he said, except in real-time situations.

There is a growing need for powerful optimizing compilers to handle these programs, he said, adding it is fortunate there are new opportunities for optimizing programs in more powerful ways.

"Since our programs will be written in data-oriented, high-level terms, it will be feasible for a compiler to 'understand' what the program is trying to do and generate a good implementation of the intent, based on various global criteria," he said.

More research and development efforts are needed to fully develop his approach, Hammer said, including determination of appropriate domains for specialized languages.

Not only does research need to be done in the technical area, but also in the psychological realm, he said.

The basic computational structures peculiar to each domain need to be isolated, but some insight on the psychology of computer programming is also necessary to determine what basic computational primitives people seem to possess, find easy to use and can readily learn, he remarked.

Free-Form Data Put Into Files Managed by 'Update' Dictionary

SYRACUSE, N.Y. – Virtually any file structure of a user's choice can be created and supported from "free-form" data input to IBM 360/370 installations equipped with the Update data maintenance package, according to its vendor, American Computing Systems Co. (ACSC).

In this environment, each input data field is preceded by a field number identifier and is terminated by a field separator identifier. Updating is controlled by file dictionaries.

All types of files are handled, ACSC said, including sequential, indexed sequential and data base organizations such as those used by Cincom System's Total or IBM's Dbomp or IMS.

Update's capabilities are application- and device-independent, the vendor said.

With the file dictionaries, records may be updated by furnishing only the key and new field contents. Beyond that, new records need not be furnished in their entirety; all fields not entered will be blanked or zeroed as appropriate, a spokesman noted.

Although fragmentary input would normally be difficult to monitor, the ACSC package is said to provide an audit trail – with any errors encountered and actions taken – showing the transaction key and type, field identifier and both old and new data content.

Because Update is modular, it lends itself to applications other than data maintenance, the vendor claimed, noting for example that the free-form multi-record input can be combined into a "single, easy-to-handle record structure for use by a specialty program."

Update has been used under DOS, DOS/VS and OS systems and is available now for $5,750 from ACSC at 624 Teall Ave., 13206.

'Auditor' Preps EEOC Reports

MONTVALE, N.J. – The Automated Compliance Auditor from Information Science, Inc. is designed to provide information an organization requires to comply with Equal Employment Opportunity Commission (EEOC) reporting rules.

Written in ANS Cobol and BAL, the package can be linked with the using organization's personnel system or used as a stand-alone application.

In addition to meeting EEOC reporting demands, the Auditor should help organizations identify problem areas before they become serious, the vendor noted.

Reporting in seven areas is supported by the Auditor. It generates parity reports, for example, which relate the internal distribution and utilization of an organization's work force to the external labor force. The work force analysis reports show distribution of employees by job, grade, race, sex and age.

Two outputs closely related to each other are applicant flow reports, which analyze applicants by race, sex, source of hire and point of hire, and employment reports, which analyze recruitment and placement patterns in relation to sex, race and age.

Activity into and out of jobs, grades and locations with reference to the relevant labor pools is analyzed in the transfer/promotion reports generated by the Auditor. Separation reports analyze the job, grade, reason, race and age of each move out of the organization.

Supporting data listings are said to itemize applicants, new hires, transfers, promotions and separations for management in a format more concise than those required by EEOC.

The software runs in 100K memory on an IBM 360/370 under OS. For $17,500, users can acquire source code, training manuals, an audio cassette, slides and a programmer instruction manual.

Information Science is at 95 Chestnut Ridge Road, 07645.

EXCPs in TSO Halved by 'QED'

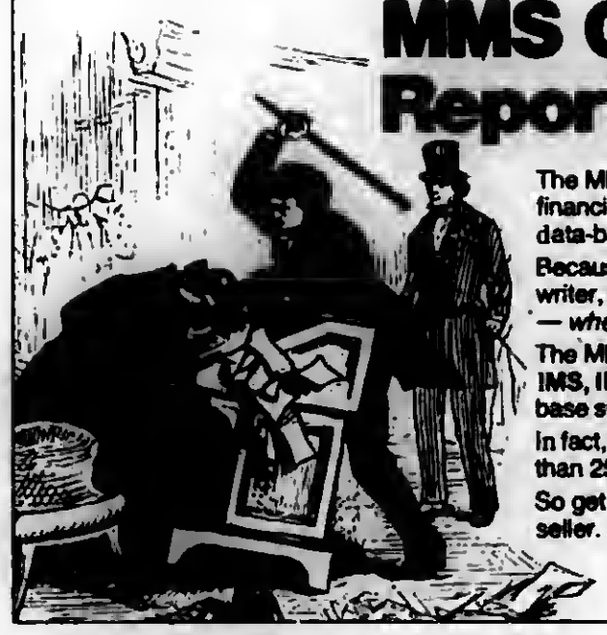
RESEARCH TRIANGLE PARK, N.C. – Large-scale IBM 360/370 users operating with TSO may be able to cut EXCP time in half through the use of QED, an editor program from Triangle Universities Computation Center (Tucc).

QED is a data set editor which operates under TSO with OS/MVT or OS/VS2 Release 1.6. The syntax is said to be compatible with that of the VS2 Release 3 TSO EDIT command.

Although a functional replacement for the IBM-supplied TSO editor, QED differs from the TSO EDIT command under MVT in that its edit work data sets are retained in memory at all times. This is the feature that cuts EXCP times in half, a Tucc spokesman said.

Developed here at Tucc for the center's own workload, QED has provided the staff with "significant interactive computing growth capability" on a 370/165. Without QED, TSO expansion here would have required additional hardware, the spokesman added.

The editor package is available to educational institutions for $800, to all other users for $1,800, and may be ordered through P.O. Box 12076, here in Research Triangle Park, 27709.



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Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

San Francisco	**Dnnfey's Royal Coach**	**Jan. 9-10**
New York	**Summit Hotel**	**Feb. 23-24**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

New York	**Essex House**	**Jan. 26-27**

Data Base Design

Given in association with Leo J. Cohen and Performance Development Corporation, this three-day seminar is a package-independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimum File Organization/Indexing Techniques, File Integration, and much more.

Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300.

Denver	**Denver Hilton**	**Dec. 1-3**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

San Francisco	**Hyatt Regency San Francisco**	**Nov. 12-14**
Chicago	**Hyatt Regency O'Hare**	**Nov. 19-21**

Data Communications Course #1010 – Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

Miami	**Marriott Miami Beach**	**Nov. 17-18**

Data Communications Course #1020 – Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Miami	**Holiday Inn Airport Lakes**	**Dec. 1-3**

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'SSDM' Backs Structured Programming

SEATTLE, Wash. – A four-day training course and three application peckages, all available separately from Boeing Computer Services, Inc. (BCS), are said to speed and simplify program deslgn, coding and maintenance for users in IBM OS or OS/VS environments.

Called Systematic Software Development and Maintenance (SSDM), the BCS approach is based on top-down design and structured programming. It involves a set of procedures governing seven phases in a project's life: requirements definition, preliminary design, detailed design, coding, certification, installation and maintenance.

The Design Expresslon and Confirmation Aid (Deca) software accepts multilevel, top-down design representetion es input. From that, it produces a "thorough, easily read" design document for use in design verification as weil as reviews with the user, BCS said.

The Translator for Structured Fortran (Transfor) program is a preprocessor that extends Fortran for structured programming and is said to be compatible with ell IBM Fortran compilers.

Though structured programs can be written in standard Fortren, BCS noted the results are often only slightly better than nonstructured code.

Enforced Nesting

Transfor is designed to allow users to write efficient; structured progrems free of GOTOs. Use of statement numbers is eliminated and the nesting of control structures is enforced by the automatic identation of control statements, the vendor claimed.

The Software Utility Routine (SUR) is a program library maintenance system. It is said to provide a means of building and retaining programs in source, object and load module forms and for introducing and testing the effects of program changes. It appears, therefore, to be generally comparable to various library systems already on the market.

Deca is available for $6,000; Transfor, for $4,000; and SUR, for $5,000. The four-day course is $375/student at a BCS regional training center, but is also available at customer locations on an RPQ basis.

SSDM is being marketed by BCS through P.O. Box 24346, 98124.

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PL/I Meeting Calls for Papers

KEYSTONE, Colo. – "Data Base and High-Level Language Interfaces" will be the focus of the 1976 PL/I Winter Symposium and papers are now being solicited by Cibar, Inc., which is organizing the meeting.

Scheduled to run from March 1 through March 5 at the Keystone Lodge here, the symposium will start with an "intensive" data base tutorial.

Monday of that week will include an introduction to data base requirements in the morning and consideration of relational data structures in the afternoon. Tuesday's program will cover hierarchical and network data structures.

Wednesday's first session will be on language interfaces and will be followed by three consecutive sessions focusing on vendor interfaces. Thursday will start with an examination of data item dictionary interfaces and then move along into presentations of the three pepers to be selected from the current call for papers.

On the final day of the conference, ettendees will hear about implications of data bases in the areas of reliability, security and privacy. The symposium is expected to end at lunchtime to accommodate homeward-bound travelers.

Registration fee for the symposium is $150 and does not include hotel reservations.

Details on the papers being sought and on registration are available from Roger J. Jones at Cibar, Suite 120, 2850 W. Serendipity Circle, Colorado Springs, Colo. 80917.

Correction

Info-Dyne, Inc. the company which recently completed a study of major users of remote-computing network facilities [CW, Oct. 15], is now located at suite 196, 4600 W. 77th St., Minneapolis, Minn. 55435.

Runtime Controls Upgrade 'CBLshort'

LYONS, Ill. – The CBLshort precompiler for IBM DOS and DOS/VS users has been modified to make some of its features into user options selected at runtime, according to its vendor, General Electronics.

The effect of runtime selection is to make the system more tailored to user needs and to require less memory than with the generalized version.

All the features of the original packege are available, including support for margin alignments, generation of JCL and punching a new source deck or running in load-and-go mode.

The abbreviation table, allowing users to use shorthand for many of the required or commonly used Cobol words, is also dynamically allocated et runtime in this latest version of CBLshort. Extending the table when more ebbreviations are needed requires nothing more than allocating a larger partition for it to run in, General Electronics said.

Written in ANS Cobol, the precompiler – with its own source code – is available for $300 from the vendor through P.O. Box 79, 60534.

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CW1105

Identify Goals or Expect CPE to Fail, Conferees Warn

By Don Leavitt
Of the CW Staff

NEW YORK – Computer performance evaluation (CPE) can provide significant leverage in improving the efficiency and effectiveness of computer- and human-related activities. But participants in a workshop on the subject agreed there are also significant opportunities to misuse CPE techniques.

Performance Evaluation

Sponsored by the Association for Computing Machinery (ACM) and the National Bureau of Standards (NBS) in 1973, the workshop conclusions were summarized for the first time by Barry W. Boehm and Thomas E. Bell in a recent issue of the ACM Sigmetrics quarterly, *Performance Evaluation Review* (PER).

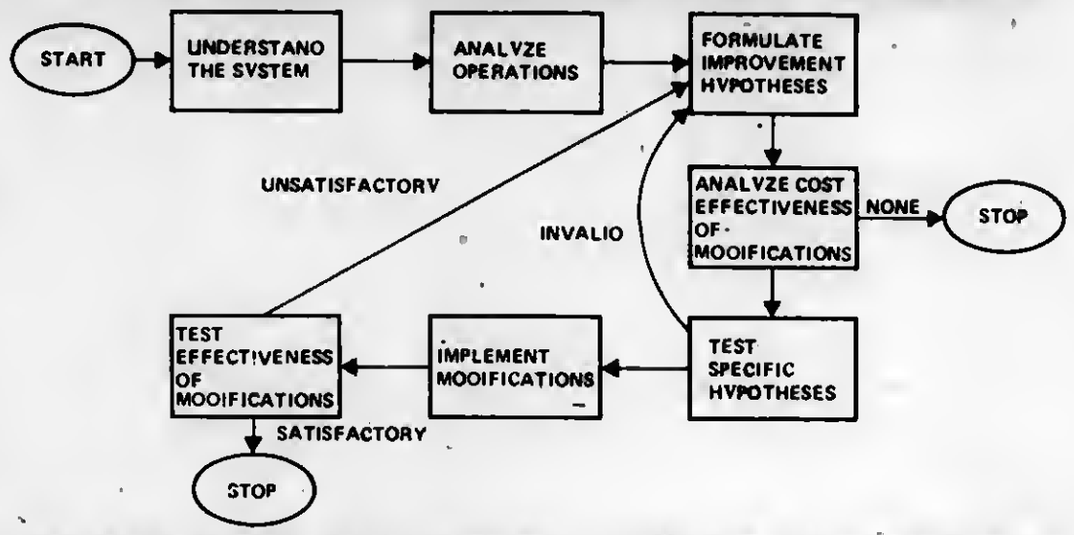
Productivity increases averaging 15% to 30% are generally achievable on third-generation equipment. However, only increases resulting in improved value or decreased cost have utility to the organization involved, the authors noted.

Again, the current state of the art could support "far more productivity increases" than are realized, but "inadequate motivation and insufficient education" limit its application.

This situation is aggravated by the lack of a handbook to apply the current knowledge, Boehm and Bell continued, pointing out "one of the strongest recommendations" made at the workshop was to have such a manual written by NBS or the Computer and Business Equipment Manufacturers Association.

Improvements in application programs and direct user provisions offer the most potential for productivity gains in both the short and long term, the workshop concluded.

Perhaps most important for the user just getting into CPE, the workshop recognized measurement does not constitute performance evaluation. Evaluation takes place with respect to the objectives and goals of an organization and "usually includes some measurement," Boehm and Bell added.



Applying the "scientific method" approach to a CPE project, attendees recognized a flow such as this would provide a structure and a feedback mechanism for refining results to the degree considered satisfactory.

Following an orderly methodology is critical if measurement or modeling is to be successful, they found. Picking a measurement tool, collecting some data and only then attempting an analysis will seldom suffice as an evaluation procedure. Guidelines for organizing the process are available, the authors noted.

Specifically, they warned, current tools make possible the collection of a wide variety of performance data, but it is often not the most effective type and "frequently causes human and machine inefficiencies."

For example, they explained, computer accounting data can be used efficiently "but accounting systems are frequently so unwieldy analysts refrain from using the data," and improved accounting systems and associated analysis software are a "major national CPE need."

Similarly, hardware monitors are "somewhat difficult" to use because probe points are located "deep in computer circuitry" rather than being immediately accessible at a standard connector.

Improved hardware monitor interfaces constitute another major CPE need the workshop concluded, although discussion recognized difficulties imposed by changing computer technology.

Important Variables

There are numerous important variables arising from measurement or modeling that must be studied in evaluating performance. Representation schemes such as Kiviat graphs or simple models often aid analysts, the authors acknowledged.

One of the more serious problems, however, is that models of computer performance "frequently" are developed and applied without reference to empirical data, and data collection is "usually" performed without using any model to aid in experimental design.

Modeling and measurement should be combined in both application and research efforts, Boehm and Bell stressed.

In an apparently paradoxical thought, they also noted "the objective of a performance analysis should not be to achieve the highest possible component utilization: in fact, higher utilization often implies reduced computing effectiveness." The objective of any CPE effort should recognize both the costs of a computer installation and the needs of users for service in a stable environment.

There wasn't total agreement on all points at the workshop and, in fact, the authors' 36-page summary, in the July 1975 issue of PER, is entitled "Issues in Computer Performance Evaluation: Some Consensus, Some Divergence."

This particular issue is available in limited numbers – at $1.25/copy for ACM members, $1.75/copy for nonmembers – from ACM headquarters, 1133 Ave. of the Americas, 10036.

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GRAHAM MAGNETICS

Fedsim Study Finds

System Architecture May Alter Apparent Priorities

By Arthur Lovelace
Special to Computerworld

The Federal Computer Performance Evaluation and Simulation Center (Fedsim) has completed a study of two Xerox Sigma 5 systems performing the message-switching function on a nationwide network.

Although the Xerox systems are not in wide use in the general DP community, the methodology behind the study and the overall findings should be of substantial interest to a much larger audience.

Performance Evaluation

The study started with a pair of machines that seemed to be overloaded and compute-bound in many instances, even though their CPUs apparently had the highest possible priority. As Fedsim discovered, these conditions were more apparent than real.

As background, the network under study provides a single integrated record communications system which efficiently meets the day-to-day as well as emergency needs of the organizations involved. It utilizes both an automatic, direct-dialing circuit-switching system and a computer-based message-switching system.

It was thought the operating efficiency of the Sigma 5s, though satisfactory, could be increased. Concerned about the high CPU usage per character through the system, network management asked Fedsim to investigate.

Fedsim monitored the two systems to identify any actual or potential bottlenecks and then made recommendations for improving the performance of each system.

Monitoring Experiments

Fedsim gathered traffic volume and descriptive data from on-site data collection and reduction software. Two separate monitoring experiments were conducted at each computer using a Comten Dynaprobe-7900 hardware monitor.

From the first experiment's examination of hardware utilization levels, Fedsim determined the high CPU usage per character through the system was not being caused by overloading the system. Indeed, just the opposite was true.

During the monitoring time period, the system was active only 45% of the time while the CPU was active only 30%. Also, each of the peripherals was busy much less than capacity.

Still seeking the reason for the high CPU utilization, Fedsim designed a second experiment to examine memory bank busy times and instruction execution activity by the CPU. Analysis of the results of this experiment revealed the problems causing the suspected inefficiency.

Of the eight banks of 16K words monitored, Bank 0 was busy 40% of the tored time, while Banks 1-7 had busy times totaling only 8%.

The operating system and the tables accessed by the Communications Input Output Processors (CIOPs) were located in Bank 0. The instruction execution activity analysis revealed 58% of the time was spent executing instructions located in Bank 0.

The remainder of the instruction execution activity was distributed throughout other areas of main memory; no significant peaks occurred. It thus appeared Bank 0 was a bottleneck.

Extraordinary Hold-Off

Another measurement, made to determine the extent to which this bottleneck affected performance, showed the amount of time the CPU was prevented from accessing Bank 0. This hold-off time was expected to be small, since the CPU had a higher memory access priority than the CIOPs.

The CIOPs are the only units that compete with the CPU to access Bank 0, but measurement showed an extraordinary amount of CPU hold-off – almost 30% of the CPU active time. Further examination of the priority scheme showed the CIOPs could override the CPU's "highest" priority.

This, in effect, gave the CPU third highest priority (after the two CIOPs). Because most of the activity was in Bank 0 and because the CIOPs had top priority, the CPUs "did nothing' 30% of the CPU active time. This hold-off time accounted for the system's high CPU utilization per character.

Fedsim recommended the contents of Bank 0 be more evenly distributed throughout main memory to remedy this problem. Fedsim also cautioned the Xerox Sigma 5 users not to be confused by the terminology "highest priority" in relation to the CPU.

If CIOPs access the same bank of memory, the CIOPs may still override the CPU. This condition can result in high CPU hold-off times to memory and in decreased throughput.

In order to prevent needlessly high memory contention and consequently high CPU hold-off times, the CIOP tables and highly used software should not be placed in the same bank of memory.

Lovelace is with the analysis directorate of Fedsim, based in Washington, D.C.



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System Charging Workshop Subject

PALM SPRINGS, Calif. – The Sigmetrics technical meeting on pricing computer services, to be held at the Riviera Hotel here late next week, will explore theoretical and practical ideas about policies for charging for services.

Scheduled for Nov. 20 and 21, the meeting, sponsored by both the national Sigmetrics and its Los Angeles chapter, will include both formal and informal sessions designed to encourage an exchange of ideas among the participants, according to general chairwoman Toni Shetler of Rand Corp.

Registration requests are being handled by JoAnn Lockett, also at Rand, 1700 Main St., Santa Monica, Calif. 90406.

Offering May Bring Protests

AT&T Introduces Two Synchronous Dataspeed Terminals

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – AT&T has moved further into the realm of data processing with the introduction of additions to its line of Dataspeed 40 terminals – in spite of protests from others in the industry that the Dataspeed offerings may violate Federal Communications Commission (FCC) regulations.

The private-line offering is aimed at applications that require clustering capability and – as expected [CW, May 22, 1974] – synchronous transmission.

The latest Dataspeed 40 models feature synchronous line transmission protocol – the first at speeds of 2,400 and the second at 4,800 bit/sec) and permit clustering of display units and printers up to a maximum of 24 displays and 12 printer terminals, the firm said.

The units' interactive mode of operation makes them attractive for a variety of computer input/output applicatlons, such as inquiry/response, data entry and retrieval, AT&T claimed.

Additional features include computer-controlled display formatting and data entry, whole character impact printing, built-in internal diagnostics and modular construction, it said.

The binary synchronous line protocol used is a standard that conforms to Ansi standard X3.28 and regulates message traffic by polling and selecting in a manner similar to that used in selective calling systems, AT&T explained.

The Dataspeed system uses a Station Cluster Controller which can handle up to six Device Cluster Controllers. These in turn can handle up to four displays and two printers each.

A full system would consist of one Station Cluster Controller and six Device Cluster Controllers, each with four displays and two printers for the total of 24 displays and six printers, the firm said.

The Device Cluster Controllers can be located up to 2,000 feet from the Station Cluster Controller and the displays can be located up to 100 feet from each Device Cluster Controller, the firm said.

Industry Objections

When the first of the Dataspeed 40 terminals were introduced in May of 1973 for asynchronous operation on switched networks at 1,050 bit/sec and 1,200 bit/sec, many figures in the industry complained AT&T was entering the data processing equipment busincss, which it is prohibited from doing by the FCC.

However, the firm claimed the offering was just an advance in the Teletype Corp. line of teletypewriters and "in no way constitutes a data processing service."

Several in the industry, however, charged the units were clearly designed for data processing purposes and not for the transmission of messages, as were the earlier teletypewriters.

Because of this, the sources charged AT&T had violated the FCC ruling that prohibits the firm from offering data processing products.

A Station Cluster Controllcr with the capability of handling four Device Cluster Controllers costs $170/mo (plus $6/mo for a mandatory pedestal). There is a $20/mo additional charge for handling six device Cluster Controllers.

The Device Cluster Controller capable

(Continued on Page 28)

NBS NAM Eases Access to Network Resources

By Robert Rosenthal
Special to Computerworld

WASHINGTON, D.C. – The National Bureau of Standards (NBS) has developed a Network Access Machine (NAM) – a specially programmed minicomputer – that automatically accesses resources available on computer networks for terminal users.

This NBS development aims to improve the efficiency and effectiveness of the Federal government's use of computer networks.

The NAM makes it possible to use one command language for accessing different resources within one network and cven across multiple networks. The same, simple user commands or protocols for log-in, host selection and service selection are used to obtain all network services.

By automatically generating the necessary interactions that accomplish the user's intended function, the NAM allows the user to be more concerned with what service is required and less concerned with how to obtain it.

The NAM diminishes the maze of protocols that exist between a user at his terminal and network-based computer service. The user must typically know different protocols to communlcate with the network and its host computers – to express his service demands to the computer and to understand the results or errors from the computer.

As manifested in the interactive dialogue between the user and computer, these user protocols are characteristically incompatible, ill-defined and machine-dependent.

The network user would be helped through this confusion of lncompatible protocols by the abillty to use one protocol to access all network services. Since standardization at the higher levels of user-network interaction could discourage competition among network service providers, it seems desirable to instead aim at compensating for nonuniformity in interface requirements through network access assistance to the user.

This idea of improving the low-level user protocol is not new to the computer industry. Catalogued procedures allow expansions of job control functions so the inexperienced user can easily perform complicated job steps and so the experienced user need not become burdened with the tedious task of explicit enumeration of detail in job steps.

This typc of assistance can be extended beyond a single computer and placed in the interactlve computer network environment. In such an environment, the user should be able to have specific programs, data and systems readily available from different computers without regard for such protocols as host computer selection, host computer log-in, host computer service selection, service initialization, service exit request, host exit request or network exit request.

Procedures on Macros

The NBS NAM alleviates this user problem with network protocols. Complex access procedures, coded and stored as macros on files in the minicomputer, are given simple names by the user. The macros are recalled from the file system by name and expanded by the NAM, producing the appropriate network or host computer dialogue.

At the time of the expansion, parameters can be passed to the macro: A possible use for a parameter is to identify to the macro a particular software subsystem. In this way, macros can be written like subroutines – general in scope, but made specific by the parameters passed to them.

The use of simple names for complex access procedures and the ability to pass parameters to macros makes the NAM a flexible aid for any user of computers, especially when the user accesses a variety of different computers.

The prototype NAM is used as a test bed at NBS to determine the utility of the NAM concept and to evaluate the effectiveness of a minicomputer in this application. A longer range goal is to use the NAM in extended applications where tutorial assistance to the user and automatic remote resource selection in a network can be provided.

The utility of the NAM is being demonstrated at NBS, showing thc effectiveness of a minicomputer in this application. An NBS technical notc describing the design and use of the NAM will be available in early 1976.

Rosenthal, project manager of the NAM at the NBS' Institute for Computer Sciences and Technology, can be reached for inquiries at the NBS Computer Networking Section, Room B-212, Technology Building, here in Washington, 20234.

Irwin Forecasts Regulated IBM As DP, Communications Overlap

By Ronald A. Frank
Of the CW Staff

CAMBRIDGE, Mass. – The increasing interdependence of computers and communications may well result in IBM becoming a regulated utility.

This prediction was made by Dr. Manley R. Irwin, regulatory expert and Federal Communications Commission (FCC) staff member, in an article on the future of telecommunications written for The Yankee Group.

In addltion to IBM and the DP community offering more and more communicatlons-type services, Irwin said the regulated telephone companies may soon be offering tariffed DP services.

"The carriers are establishing beachheads before the state regulatory agencies. The result may be that in two or three years such services will be upgraded into some software or manipulative capability rendered to the public. It is possible that regulated carriers will be offering a specie of computation on a tariff basis," Irwin said.

The Bell System recently introduced a display terminal with printing capability called the Modcl 40 teletypewriter. The Model 40 is presently a dumb terminal, but subsequent generations will incorporate data processing capability and this unit will evolve into an intelligent terminal, Irwin said.

Also mentioned in the article was Bell's Transaction Telephone, described as a "credit card verification unit which might be viewed as a specie of computation."

Future generations of Bell's Dataphone Digital Service might well incorporate software applications that will enable the

(Continued on Page 28)

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N.Y. Attorney General Urges Interconnect Liberalization

By Edith Holmes
Of the CW Staff

ALBANY, N.Y. – Despite opposition from the New York Telephone Co., the attorney general of this state has come out in favor of providing a wider variety of interconnections for customer-provided equipment (CPE).

In a statement commending New York State's Public Service Commission for holding hearings on interconnect offerings, Attorney General Louis J. Lefkowitz urged the body to broaden its recommendations beyond requiring the phone companies to supply a simplified, low-cost interface device.

The commission should also provide an alternative to an inexpensive interface device in the form of certification by an independent certification laboratory, he said.

Such certification, he noted, is favored by everyone involved except the New York Telephone Co.

"We believe that the commission should provide an opportunity to the public to use equipment of their choice provided that it meets minimum standards to protect the integrity of the telephone networks," the attorney general said.

By making certification available from approved laboratories as well as the telephone companies, "the consumer will have a realistic alternative" without a decrease in "the high level of service required of the operating telephone companies," he added.

A certification laboratory would serve as a check on any company certification program, Lefkowitz noted.

"Without such independent certification, there would be little if any incentive for the telephone companies to reduce costs of interconnections," he stated.

Noting uncontested testimony before the commission showed between 90% and 95% of the answering devices attached to the New York Telephone Co. network are hooked up in an unauthorized manner, the attorney general said this noncompliance "is clearly related to cost.

"Such noncompliance is not in the telephone company's best interest or that of the public's," he continued. "However, its elimination can come about only with a reasonable and fair approach to interconnection such as would result from a certification program."

Synchronous Dataspeeds Added

(Continued from Page 27)

of handling two displays costs $140/mo. (plus the mandatory $6/mo for a pedestal). There is a $32/mo charge for the ability to handle two additional displays, AT&T said.

Each display unit costs $63/mo and the printers cost $90/mo each, the firm added. The pedestal is optional for these units at $6/mo.

For a full system with one Station Cluster Controller, six Device Cluster Controllers, 24 displays and 12 printers, the recommended price is about $3,900/mo, the firm said, adding the representative price would work out to around $165/mo per display for the average installation.

For users who want a smaller configuration, the firm is offering a "mini cluster controller" which combines the functions of the Station Cluster Controller and the Device Cluster Controller. This unit is capable of driving two displays and one printer, the firm said.

The mini station controller costs $170/mo and is capable of handling one display and one printer. There is a $20 additional charge for the ability to add another display.

Shipments of the units will begin this month and will be available from Bell System operating companies by mid-1976, AT&T said. Several of the operating companies are expected to file tariffs on the offering this year, the firm added.

Regulated IBM Seen As Future Possibility

(Continued from Page 27)

phone company to perform "mixed elements of communications and computation," Irwin said.

IBM has announced plans to develop a domestic satellite system oriented toward the transmission of data and computer messages between terminal devices and computer centers. The system will bypass the local and toll facilities of the telephone carriers.

The FCC has approved the plan subject to IBM's willingness to interconnect the terminals manufactured by other firms to IBM equipment, Irwin noted.

Regulation vs. Competition

As the overlap between computers and communications becomes greater, it becomes comparable to the telecommunications industry which is regulated and the computer industry which is not regulated, Irwin pointed out. In this contest, AT&T has consistently advocated regulation instead of competition.

"If IBM continues to account for more and more of a percentage of computer mainframes on the grounds of corporate efficiency, IBM is inviting nothing less than the status of a [regulated] public utility," Irwin said.

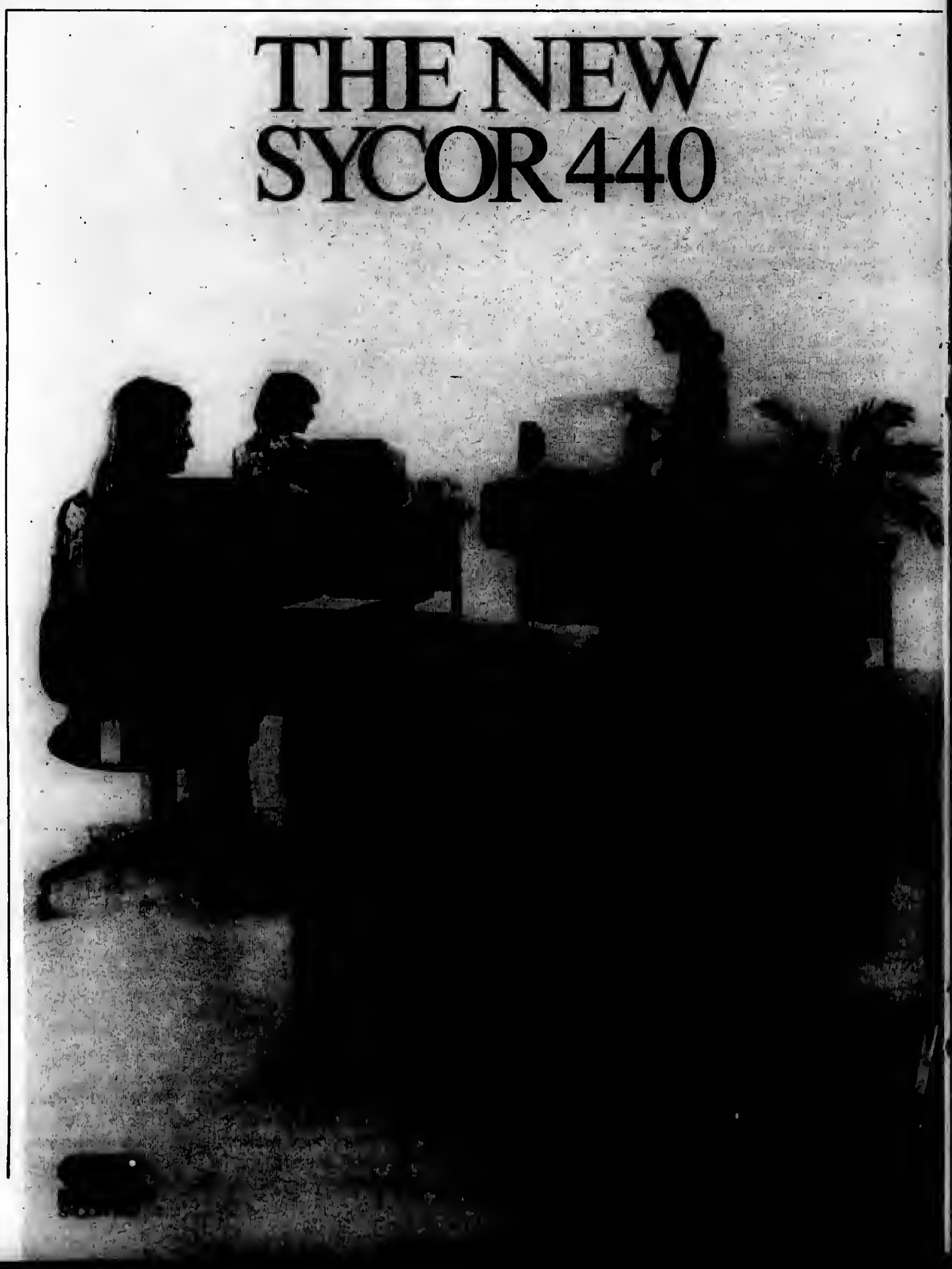
"Certainly, in the past, public policies have been reluctant to assign the bulk of an industry's output to one firm and to entrust that firm [with setting] the industry's prices, profits, and investment decisions," he added.

"It is perhaps ironic that the regulated nature of the mainframe industry rests on the government's antitrust suit. An IBM victory may well spell an industry defeat; an IBM loss may well spell an industry victory," Irwin said.

The article was written as part of a continuing research study by The Yankee Group called "The Unbundling of AT&T: Implications and Opportunities." The study is available from the firm at Box 43, 02138.

Correction

The price of the TP 2000 teleprocessing monitor from MRI Systems Corp. [CW, Oct. 15] is $25,000 for a paid-up lease.



Using Touch-Tone Telephones

Shoppers Order Catalogue Items Directly From System

TORONTO – Round-the-clock catalog shopping is on the way at Simpsons Sears Ltd. here thanks to a computer, an audio response unit and a Touch-Tone phone.

As a result of an experiment in which Simpsons telephone shoppers in the metropolitan area proved they liked communicating with the computer just as well as with the Simpsons operator, the nationwide department store expanded its Comp-U-Shop telephone-ordering service to 16 hours a day, six days a week and will go to 24 hours a day before long.

Ninety four percent of the system's users said they preferred this method to the traditional operator-assisted approach to catalog ordering," Mike Lutze told the Canadian Computer Conference here last week.

Lutze is manager of distribution and operating systems for the store.

The major hurdle that blocks nationwide implementation of the system is the fact that the largest proportion of telephone users here are still dial-phone users either by choice or because Touch-Tone service has not yet reached their area, he said.

Copes With Two Problems

Despite the curiosity the new system has generated, Simpson's Compu-U-Shop system was not installed as a novelty, but rather to cope with two problems that plague the catalog-shopping business, he said: transcription error and customer disappointment when the item ordered is out of stock, he explained.

One of six phone orders contains a transcription error serious enough to require special attention, he said.

"The customer, when making his selection, copies catalog number, color and size on a piece of paper before calling – potential error number one," Lutze said.

When the customer calls to place his order, he transcribes his written order into the spoken word. The Simpsons operator, in turn, transcribes it back to the written word – for potential errors two and three," he said.

"The written orders are keyed in optical character recognition font by an order entry typist, for potential error number four.

Customer disappointment, the second source of difficulty, arises out of the implication that, if an item is displayed, it must be available, Lutze said.

The retail store merchant can avoid this problem by removing merchandise from the store.

The catalog merchant cannot do this since his pages are finalized months in advance of publication, he said.

Two Objectives

Before committing itself to any new system, Simpsons decided it must accomplish two objectives.

First, capture only valid order information by eliminating the multiple transcriptions in the conventional order-entry procedure, and, second, minimize the effect of customer disappointment by notifying the customer, when the order is placed, if the item is not available.

The classic data processing approach would have been an on-line order-entry system, Lutze said. However, with 600 catalog sales offices, the cost of terminals would have been too high.

The solution had to involve inexpensive terminals, and the Touch-Tone telephone seemed ideal. It was inexpensive, easy to operate, reliable and maintained by one of the largest service organizations in the country, he said. It has a numeric keyboard and earpiece for audio response.

More important, it was already installed in thousands of households at no expense to Simpsons.

Customers were surveyed to test their reaction to the system, and 2,000 in the metropolitan area agreed to participate in the test.

Simpsons built a special customer data base, accessible by phone number, with the customer's name, address, account number and delivery route number.

As Comp-U-Shop was conceived, the customer, using his Touch-Tone phone, dials into the switched network with Simpsons' Comp-U-Shop telephone number. The dataset answers the call and establishes a communication path to the Periphonics T-Comm 7 audio response unit.

This device is capable of accepting data keyed on a Touch-Tone telephone and passing it on to an IBM 370/158, Lutze said.

The 3705 communications interface connects the audio response unit to an IBM 370/158 containing the software and application program controlling the overall system.

When the customer's call is answered, the audio response unit is directed to say, "Sears Comp-U-Shop. Your home telephone number, please."

The number entered by the customer is used to access the on-line customer file and a record is retrieved. If the number entered is not a valid number (such as not consisting of seven digits or starting with the digits "0" or "1") or if there is no record found under that telephone number the program reissues the message.

After three attempts to retrieve a customer file, the call is terminated by the program and a message is issued for callback.

After the customer has identified himself, the system requests the first catalogue number of his order, Lutze said.

If the item is in stock, both quantity entered and current unit price are quoted so the customer may verify what he has entered.

If the item is flagged as being temporarily out of stock, the customer is advised and given the option of canceling the item or waiting for a delayed shipment. If the item is no longer available, the customer is so advised and the item order automatically canceled.

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TAL II. To extend the 440's power, use our new data entry language, TAL II. This easy-to-use, high-level language lets you customize data entry programs. Instructions are also provided for arithmetic operations, conditional data entry, range checking, table look-up, equal/compare and a host of other intelligent features.

Shared file access.

The 440 system lets you share and access files locally, reducing investments in telephone communications and central CPU resources.

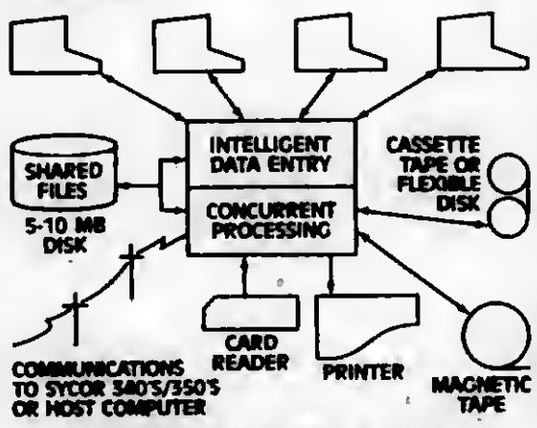
Data entry made easy. Now each operator, at her own display, can make use of current data in shared files to support data entry functions. For reduced keystrokes and lower error rates.

Inquiry/Response. File look-up is made simple with up-to-date information on-site, using the 440's own file management and disk storage capabilities.

System modularity.

Design your own system with a variety of options and peripherals.

Supports from 1 to 8 displays. Each is controlled by the Sycor processor and is capable of performing tasks independent of other displays.



Choice of 5 and 10mb disks. Store and retrieve programs, shared files, and data at remote locations.

Wide variety of peripherals. And to complete our system configuration, choose from matrix and line printers, computer-compatible tape drives, card readers, and a variety of communications options.

Compatibility.

There's full software compatibility with our Model 340 and 350 stand-alone terminals. Keyboards are also compatible.

Programming. One program fits three different systems—340, 350 and 440.

Communications. Communicate with the mainframe, emulating IBM 2770, 2780 or 3780 protocols. Or use the 440 as a polling station at your central computer site to receive and transmit data to remote 340s, 350s, and 440s.

Concurrent processing.

And best of all, while data entry is being performed in the foreground, you can be doing other jobs concurrently in the background. Jobs that can save you time and money. Jobs like:

Remote job entry. Use the 440 with its card reader and 300 LPM printer for large-scale remote job entry. And since the system contains a CRT and a keyboard, you don't pay extra for them.

Multi-terminal printer support. Each display can interleave print data to one printer as the data is being entered. So, you don't need a separate printer for each display.

Report generation. Sycor-provided programs let you produce all sorts of management reports—sales analysis, inventory, or billing—at the same time as you are performing data entry.

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The Hewlett-Packard 3000 is a minicomputer?

"The 3000 a minicomputer? I think calling the 3000 a mini is an abomination!"

When we asked Mr. Thomas Harbron, Director of the Computing Center, Anderson College, Anderson, Indiana, what he thought about the HP 3000, he had some very interesting things to say:

"We're using the 3000 for administrative processing, academic work and some commercial work. We have 27 terminals and we selected the 3000 because we wanted a system that would provide us with remote access and would do general purpose types of things from the terminals. The 3000 allows us to do many different things at different terminals. In fact, it does everything we expected it to do and was the only machine we could find in its price class that would. I'd recommend the 3000 to others. It's a powerful and versatile machine. And it's cost effective as well. It's half the price of anything that comes close to it."

"I don't think that Hewlett-Packard ought to call the 3000 a minicomputer. It is a complete medium-sized system."

That's what the EDP center manager of an aircraft manufacturer said about the 3000. He also had this to say:

"One primary reason we bought the 3000 was to collect and analyze radar development data. The problem is that we have to collect data fast enough, pipe it to a computer, analyze it, and then make the necessary instrument adjustments. HP's 3000CX was the answer. We also bought it for its interactive capability. Very significantly, in our acoustics department we had to have the ability to turn around data analysis fast. The 3000 has been a real cost saving computer for us. For the last two years I was the entire staff for the 3000. Not a great deal of detailed knowledge of the system is necessary. Technicians can use it without much training. I'm very much sold on the 3000. And it's definitely a complete system—not a minicomputer."

"It allowed us to run eight times the volume at a third the cost. No minicomputer could do that!"

The above statement was made by the corporate banking division EDP manager of a major California bank. He also said:

"We've had the 3000 for over nine months. A year ago we were on a time-sharing system and the cost became prohibitive. We contacted six different companies to look over and bid on a proposal that defined our needs. HP was the only one that could handle our total application of management information for the Corporate Banking Division. The 3000 is not just a mini—it's much more. We're constantly amazing people here with what we can do. It's not hard to operate, not hard to cope with. But our favorite topic is that we're paying less than one third of what we were paying and running four times the volume. And this year, we'll double our volume again. That's eight times greater and less than one third the cost.

That's really productivity!"

"We found the only thing mini about the 3000 was its price."

When we asked the EDP center manager of another major manufacturing company about the 3000, that was what he had to say. He also had this to say:

"Our computer needs include both scientific and commercial applications. We were phasing out our teleprocessing terminal and our Environmental Monitoring Division's computer. So we started looking. We spent several months studying computer systems, and rated them on speed, versatility and ease of operation. The result of our study showed that the HP 3000 provided these requirements and had the best cost/performance ratio. We didn't fully realize the potential of the 3000 until we started programming it. We have experienced a significant cost savings in the seven months we've had the 3000 and we expect a greater savings in the months ahead. We really like the interactive CRT for programming and data input. Being a multi-programming system we can have many users on at the same time. The power and speed of the 3000 is equal to a large machine. It's no mini. Calling it the Mini DataCenter is more accurate. I'd definitely recommend the 3000 to other potential users. In fact, we already have. We feel they would be money ahead."

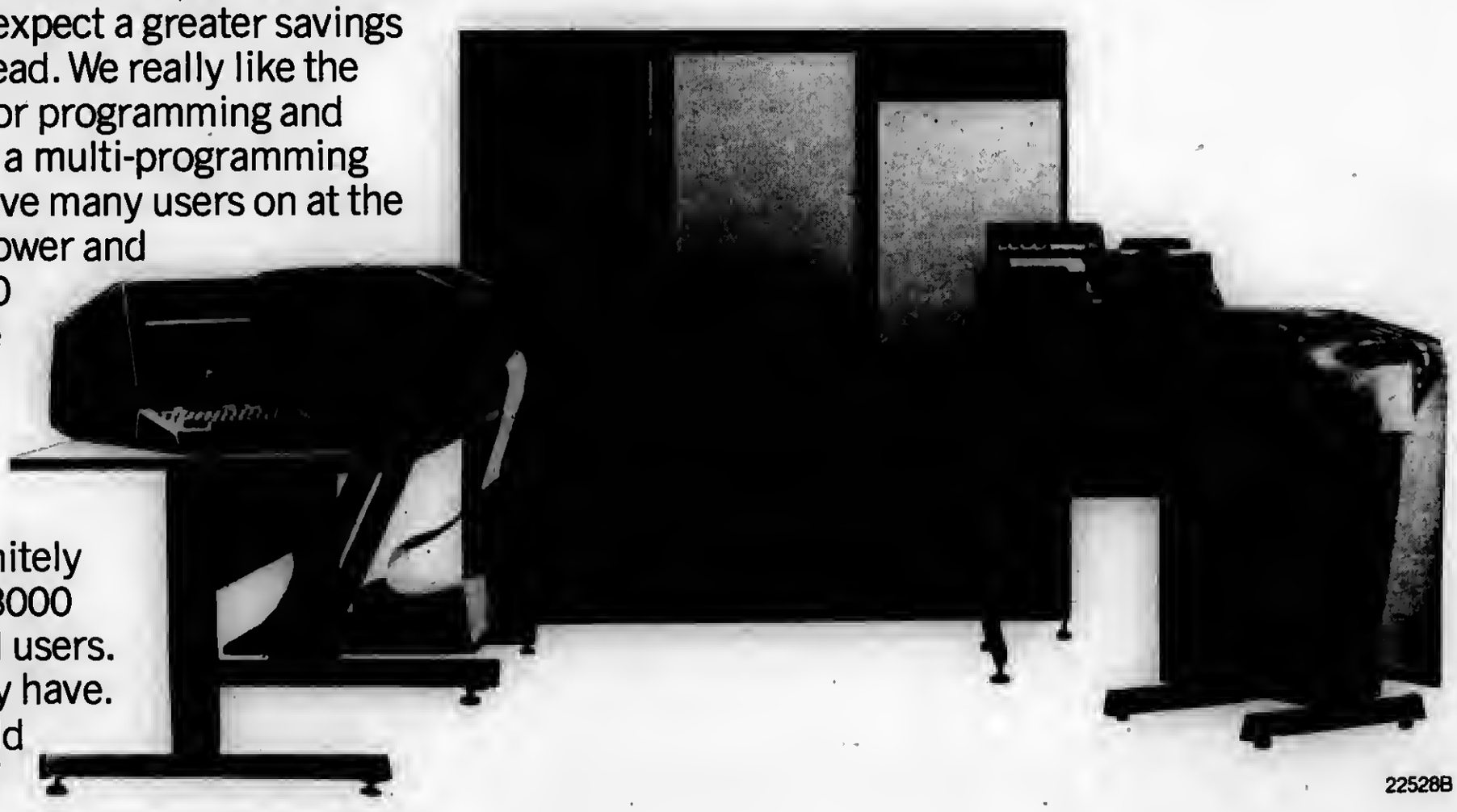
We're glad these and other users of the HP 3000CX set us straight. We called it a minicomputer because its state-of-the-art technology lets us sell it for a minicomputer price. From now on we'll call it a Mini DataCenter.

We want you to get the whole story. Write us for your copy of our HP 3000CX Mini DataCenter booklet. We know you'll find it interesting, informative, and maybe a bit surprising.

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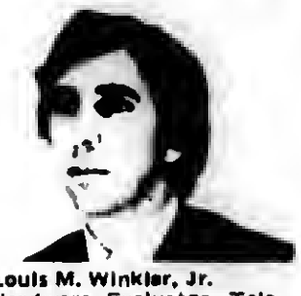


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Burroughs TU 1700 Terminals Designed for Banking Industry

DETROIT – Burroughs has broadened its line of terminals for the banking industry with the introduction of the TU 1700 series of teller terminals.

The series includes a 60 char./sec matrix printer, a choice of visual display configurations, capabilities for use of magnetically encoded plastic cards and a hand-held keyboard with which customers can enter their personal identification numbers.

The TU 1700 series includes four models. Any combination of models with numeric or alphanumeric keyboards may be selected and combined in a branch location or in a network. All models provide alphanumeric output.

The models are code-compatible with current TU 700 series teller terminal models. This protects the user's investment in currently installed equipment and application programs and also means a user can replace teller terminals with TU 1700s or can mix TU 1700s in an existing network without modification to the branch processor or central computer's programs, Burroughs said.

Among the features of the TU 1700 series terminals are:

- A matrix printer which provides 60 char./sec alphanumeric printing on a 150-position print line, with a programmatically controlled tab and return function for positioning to the most significant character at 150 char./sec.
- An input and display subsystem with either a Self Scan display that is an integral part of the TU 1700 console or a CRT display located near the console.
- Either of two magnetic card reading modules. The modules are compatible with current industry specifications for second-track or third-track read.
- A transaction control keyboard which is under program control and provides numeric entry, eight transaction keys, 16 character keys and 16 operator control keys. In addition, an alphanumeric keyboard is available.
- Automatic passbook reading (APR), which is in use on many of the currently installed TC and TU series teller terminals. APR provides automatic reading of the passbook balance, account number and next posting line, using information stored in a magnetic stripe attached to the passbook.
- An optional, hand-held keyboard which allows the cardholder to enter a personal identification number to verify that he is an authorized user of that card.

The four models include the TU 1702 numeric keyboard basic teller terminal; TU 1706 alphanumeric keyboard basic teller terminal; TU 1752 numeric keyboard teller terminal with APR; and TU 1756 alphanumeric keyboard teller terminal with APR.

TU 1700 lease prices range from $233 to $330 per month; with purchase prices ranging from $7,000 to $9,800.

How To Train Your Programmers in Assembler Language for $15 Per Student

During the last three years, we have developed and published two books on System/360-370 assembler language—one for DOS, one for OS. These books are so effective that most DP professionals can learn assembler language from them using the books alone. In fact, as you will see later, I guarantee it.

Once a programmer finishes our assembler language text, he is more productive. Why? Because he can quickly find the statement that caused a program check . . . regardless of the language he's using. Because he can write and use assembler language subprograms. Because he can maintain and develop complete assembler language programs . . . even ones that use ISAM or direct files. Because, for the first time, he understands what is happening as his programs execute . . . he's independent, he's in control.

4 Reasons Why These Books Are Effective

1) These books were written by an expert from industry, Kevin McQuillen. He's been a DP manager, consultant, and manufacturer's rep so his books are chock full of solid, practical, real world advice.

2) Kevin selected the content of these books based on an analysis of the tasks normally required of an applications programmer. That's why these books contain everything of use to the average programmer and very little that isn't. That's also why the books give substantial coverage to job control language. The DOS book covers DOS and DOS/VS; the OS book covers MFT, MVT, VS1, and VS2.

3) The books are organized in the most effective way possible for a programming course. Quite simply, a complete subset of BAL is presented in the first three chapters of the book. After this, all material is organized by function (debugging, table handling, subroutine linkage, etc.). As a result, the student always sees the relationships of the parts.

4) Each book contains dozens of complete program listings. They start with card-to-printer programs and end with programs that create and retrieve direct files. In between there are listings for routines and programs that perform code translations and input validations, set up the linkage between mainline modules and subprograms, load and use tables in storage, create and retrieve sequential and ISAM files, and so on. In our experience, these listings, more than any other factor, determine whether or not a course is effective. And they are the missing ingredient in most assembler language courses.

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Micom Multiplexer Handles Synchronous, Asynchronous Lines

CHATSWORTH, Calif. – Micom Systems, Inc. has announced the DDM 40/01 time division multiplexer, with prices starting at $1,000, to multiplex synchronous and asynchronous terminals or modem links into a synchronous serial data stream compatible with voice-grade, broadband or Digital Data Services.

Interfaces are available for direct connection to either the Bell DSU or CSU. The Micom DDM 40/01 uses a timing concept that permits use with multiple dial-up synchronous channels.

Asynchronous lines, either dedicated or dial-up, can be intermixed with the synchronous lines.

A small number of asynchronous terminals, for example, can be intermixed with a higher speed device such as an RJE terminal for transmission over a single leased line, the firm said.

Synchronous lines of practically any speed can be intermixed for transmission over a link with excellent efficiency at speeds of 600 bit/sec to over 230,000 bit/sec, the firm added.

Both synchronous and asynchronous channel interface modules are available for dial and polled network operation.

The DDM 40/01 is available in table-top and rack-mount configurations supporting from two to over 4,000 channels. A working system with units at both ends of the link costs about $2,800, the firm said from 20426 Corisco St., 91311.

User Benefits Depend on Storage Requirements

By David N. Freeman
Special to Computerworld

Users might wonder whether there are any positive reasons to move to on-line mass storage systems such as IBM's 3850, Control Data Corp.'s 38500 and Ampex Corp.'s Terabit memory.

Does this type of storage offer new functions, improved system responsiveness or improved mainframe utilization?

Unfortunately, the answer seems to be "no"; any function of response that mass storage devices offer can be more conveniently achieved with conventional disk subsystems. Even so, mass storage can offer advantages that are important to some users.

Who Needs Mass Storage

Most installations requiring at least 20 billion bytes of on-line storage, but none requiring less than 5 billion bytes need mass storage.

Using the newest IBM disk generation, each 3350 spindle holds approximately 317 million bytes on-line. Twenty spindles can satisfy a 5-billion-byte requirement cost-effectively, although resulting response times are much faster than needed for most applications.

Mass Storage Part 2

Storage requirements for data bases dominate all other on-line needs: systems residence, program libraries, scratch storage for sorting and file processing plus queue space for jobs and message processing.

However, 70 to 80 spindles of 3350 storage are required to keep 20 billion bytes on-line; this represents a staggering monthly rental plus difficult problems of creating and managing adequate floor space and operations coverage.

The above parameters – mass storage devices for installations exceeding 20 billion bytes, conventional disk storage for installations less than 5 billion bytes, with a gray area between – depend of course on current offerings of the disk manufacturers. Should a major manufacturer unexpectedly offer a billion-byte spindle, one might scale up "20" and "5" to "50" and "15," respectively.

Considering the rapid increase in spindle capacities cited earlier, how can we justify "20 billion" and "5 billion" today as coefficients for long-term choices pro or con mass storage systems. The answer is simply that applications requring massive on-line storage typically experience steep annual growth in space needs; today's 20-billion-byte data base may well grow to 50 billion bytes by 1980.

In one industry after another, one application area after another – customer information, production and inventory control, sales forecasting, scientific and engineering calculations, etc. – on-line data bases have grown as rapidly as the capacities of succeeding generations of disk devices.

(Continued on Page 36)

Itel Plans 3350, 3850 Equivalents For Virtual, Non-Virtual Shops

By Patrick Ward
Of the CW Staff

SAN FRANCISCO – Itel Corp. will introduce equivalents for IBM's 3350 disk drive and 3850 mass storage system but – unlike IBM – Itel will support the products on 360/65s under OS and VS and on non-Virtual 370s as well as on Virtual machines.

Itel's 3350 equivalent will offer about the same 317M-byte storage as IBM's 3350, but will have a removable disk, according to Richard A. Whitcomb, a vice-president of Itel's Data Products Group.

Called the 7330-12, the disk drive will be able to share the same controller as Itel's current 7330-1 and 7330-11 drives, both of which will be field-upgradable to 7330-12s.

Univac's Information Storage System Division (ISS) will build the drives with shipments beginning in early 1977, Whitcomb said.

ISS will also build the Itel 7850 mass storage system which will appear in the third quarter of 1978, he said.

Itel also plans to add a 6,250 bit/in. tape drive from Telex in mid-1976 and add-on memory for the 370/168 in January, Whitcomb added.

On the software side, Itel is working on Vtam for 360 OS and DOS/VS shops; support for its 3330-equivalent disk drives under OS/360; video console support for OS/360 and DOS/VS; Data Language/1 for 360 OS and DOS/VS shops using Vsam; and a teleprocessing monitor, according to B.R. Cabanis, vice-president of systems support.

The announcements fit in with Itel's view that the "migration game is over" and that both the 360 and 370 have long product lives ahead of them, Whitcomb said.

He pointed to the high number of purchased machines in the field, including some 70% of the 168s. "You're not going to find that the people who bought those machines are going to turn around and buy something new," he said.

Current 168 users have plenty of capacity and a wide peripheral choice; they can afford to sit tight, he said.

Whitcomb doesn't see an IBM Future System announcement coming until 1980-1981, and then it will be a "traffic cop" distributed processing system that will work with 370s, he said.

In the meantime, IBM is enhancing its 370 line, he said. The company may announce a "148" with improved price/performance early next year and may also field-enhance 168s at about the same time, he said.

IBM has already improved the internal performance of its European 370/115s and 125s by 15% to 20%, he said.

Like the 360s and 370s, IBM's 3330 drives have a lot of life left in them, Whitcomb said. "What's been purchased won't go away," he said, predicting a slow migration from the 3330s.

IBM's 3850 is "a good technology," but initial deliveries will be slow, Whitcomb said. "IBM has some problems with it, no question."

Two Key-Display Systems Among Offerings From MDS

PARSIPPANY, N.J. – Mohawk Data Sciences Corp. (MDS) has announced additions to its key-to-disk product line which, it said, offer users an orderly upgrade to current systems at price/performance ratios virtually unmatched in the industry.

The Model 2409-2 key-display system, with disk storage capacity of 90,000 125-character records, was introduced for large installations keying high volumes in multiple shifts.

The Model 2409-3 key-display system, with disk storage capacity of 150,000 125-character records provides greater capacity than the 2409-2 and permits easy expansion for the user as volume and use grows, the firm said.

Software announced at the same time allows the user to custom-design validation and edit routines during the data preparation cycle for the 2409-2 and 2409-3 systems as well as the previously introduced 1204, 2409-0 and 2409-1, the firm said.

The firm will also offer concurrent processing on all MDS key-to-disk systems, including the Model 1200.

The 2409 systems offer tripartitioning, allowing foreground, background and independent activities such as communications, media conversion and printing to occur simultaneously with keying for optimum multifunction economy, MDS said.

Up to 64 subformats per job are now available on all MDS key-to-disk systems as well, allowing the operator to focus attention on keying rather than decision making.

An additional feature allows the operator to display prompting messages on the keystation screen.

Cumulative Storage

The 2409-2 and 2409-3 key-display systems fit bidgets and requirements ranging from keypunch replacement to large, clustered data entry, the company said.

The large disk provided with the 2409-2 and 2409-3, in addition to handling routine large-volume data entry tasks, allows cumulative storage of data which is collected only weekly or monthly.

This eliminates the need to separate infrequently run jobs into smaller batches, the company pointed out. The extra capacity is also useful for holding a

(Continued on Page 34)

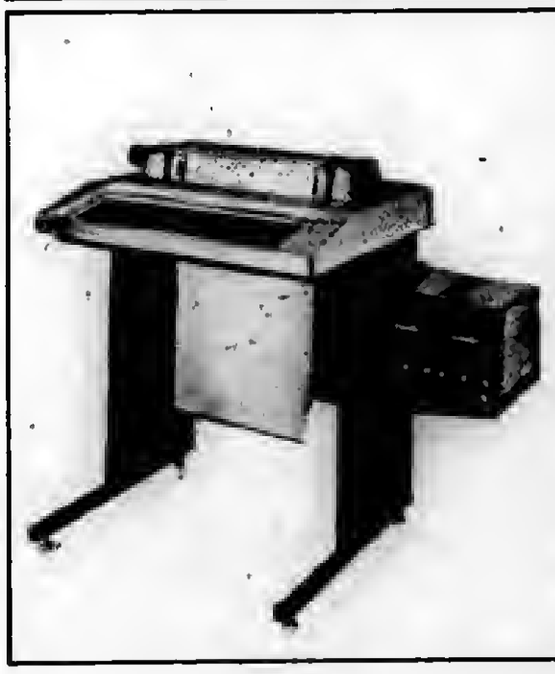
Upkeep Fees Rise 9% For Univac Products

BLUE BELL, Pa. – A 9% increase in maintenance charges for all Univac computer products and systems, effective this month, has been announced by the firm here.

A 5% increase in rental charges for certain terminal devices also took effect Nov. 1.

The terminal products affected include the Uniscope 100, Uniscope 200, DCT 475, DCT 500, DCT 524, DCT 1000, DCT 2000, DCM and modems.

No increase in the purchase or rental prices of computer systems and other peripherals is planned at this time, the firm said.



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Eliminates Data Entry Backlog

User Sidesteps Card Costs by Switching to Key-to-Disk

By Richard DeFord
Special to Computerworld

SPRINGFIELD, Mo. – By switching the bulk of its data entry workload to key-to-disk, the General Council of the Assemblies of God overcame a big backlog and sidestepped rising card prices.

Beyond that, the data entry work now takes one-third fewer man-hours than it did.

The data entry workload at the General Council is widely varied, including orders, subscriptions for periodicals, insurance programs, contributions, accounting applications, payrolls and miscellaneous jobs, as well as maintenance of inventories and the master data files involved.

The General Council has an inventory of 8,000 different items, publishes 21 different periodicals, offers an insurance program serving more than 11,000 persons and processes four payrolls. The council also processes contributions received for about 3,500 fund accounts, including the denomination's appointed missionaries.

Order and contribution documents number 2,000 daily, with an average of 12 transaction/document.

Operating two shifts, data entry previously consumed 500,000 cards and 3,900 man-hours per month. During a quarterly rush of Sunday School orders, the council had a backlog of seven days' work.

With this unacceptable backlog and soaring card costs, the council decided to investigate the claims of several data entry vendors.

The group settled on Univac's Cade 1900 system. It had a good price and it offered a Cobol subset compiler which allowed all four arithmetic functions plus table lookup, editing, range and validity checking, but without the software limits of other programs.

The council's largest application required 22 program cards under the previous system; Cade provides the selection of a desired "card" format in a fraction of a second.

It was easy to teach personnel to operate the system; no programmer is required. The Cade memory capacity can be expanded in-house without changing the system.

Maintenance support was one and one-half hours away, presenting the only undesirable aspect of the system. It is only 10 minutes away at the present time. There have been about 29 hours of down-time since the system's installation in October 1974.

In a year's time, the council's card usage has dropped to 50,000 per month; 2,600 man-hours do the work; and the backlog problem has been eliminated.

–DeFord is supervisor of computer services for the General Council of the Assemblies of God.

MDS Adds Key-Display Systems

(Continued from Page 33)

disk-resident library of user programs.

Price of the 2409-2, in a typical 16-keystation configuration, averages about $129/mo per keystation with maintenance included on a three-year lease.

The Model 2409-3, in a similar 16-keystation configuration, costs about $135/mo per keystation with maintenance on a three-year lease.

SIP Language

The firm is also offering more than 40 software packages for appropriately configured key-to-disk systems to enable flexible job definition and validation, formatting and arithmetic capabilities.

For the user who wants to do advanced editing or formatting on the key-display systems rather than on a mainframe, MDS has developed a programming language called Self-Interpreting Program (SIP) to complement the packaged software.

The SIP language allows users to design their own, unique data validation and manipulation functions at the data entry level, without having to resort to costly and time-consuming modification to mainframe software, MDS said.

Up to 16 SIP programs may be active at one time within the key-display operating system to assist the operator with keying and to edit data according to installation requirements. Multiple keystations can access the same SIP program simultaneously.

Concurrent Processing

The MDS 2409 key-display systems accommodate multiple functions in up to three partitions without interfering with normal keying operations.

The systems permit foreground keying and background key-to-disk functions, such as dumping to tape, as well as independent utilities such as various communication emulators, formatted printing or a variety of media conversion routines to occur simultaneously.

For the first time, background communications in IBM 2780/3780 mode is available for MDS 1200 system configurations.

Other communications emulators are available for nonconcurrent data communications.

Wright Line Adds Punches

WORCESTER, Mass. – Wright Line has added two devices to punch rectangular holes in plastic badges or identification cards read by contact or photoelectric static card readers.

The models 2611-00 and 2621-00 punches are heavy-duty, electrified versions of Wright Line models 2610 and 2620.

The Model 2611-00 encodes standard 20-column Type 2 and 51 credit cards.

The Model 2621-00 encodes 22-column Type 3, 4 and 5 identification/badge cards; 15-column Type 1 cards; and 80-column paper or plastic cards.

Each device costs $1,195 from the firm at 160 Gold Star Blvd., 01606.



Hierarchy of Systems Helps Maker Test Carburetors

Special to Computerworld

ROCHESTER, N.Y. – A carburetor test system at General Motors Corp.'s (GM) Rochester Products Division (RPD) here harnesses the power of a hierarchy of computers to significantly extend large-scale, high-speed test operations.

For example, individual test stands perform a variety of functions and test different models concurrently. Programs at individual test stands can be changed at the touch of a button. Software development is handled in the same central system concurrent with on-line testing, and the system can be expanded with relative ease to handle additional function and test volume as dictated by operations.

Designed, implemented and operated by testing and engineering personnel in RPD's Manufacuring Development Department, the on-line real-time system presently has 30 test stands in operation, but could handle hundreds.

"We have evolved from manually operated drill presses to dials and transfer lines for machining of parts and now to the computer for calibrating and testing of carburetors," said Bernard E. Frank, manager of manufacturing development.

The hierarchy of computers includes specially designed controllers or minicomputers that are part of each test stand. These serve as satellites to the remainder of the hierarchy that includes an IBM 370/145, System/7s and associated equipment and programming systems.

No Newcomer

RPD is no newcomer to computer-based test operations. In 1968, a process control computer was put to work controlling over 100 test stands.

Still in operation, it has the capability of calibrating and testing upwards of 23,000 carburetors daily. The test stands are wired directly to the computer, which is backed up by a second computer.

In 1971, RPD heard that, for 1975-model cars, it would have to test a much more complex carburetor. That meant a new test facility would have to be set up. While the existing system was performing to specifications, it was already operating at capacity.

"The logical first reaction was to consider duplicating the old system, but that would not have meant progress," said Lawrence B. Barnes, staff production engineer in computer systems engineering. Barnes supervised development of the new system and now has overall responsibility for its operation.

"We had been thinking for some time of the advantages to be gained if we could readily change test stand functions. Redesigning and rewiring of a test stand is a costly and time-consuming effort that can be justified only in certain situations.

"We wanted the flexibility to make test stand changes through programming or software changes. From this capability, a number of advantages would follow."

RPD first decided to put a minicomputer in each test stand. Specially designed to meet the company's requirements, the mini would provide computer control at each stand, housing the software for whatever job was on the stand.

An alternative was to buy test stands with advanced electronic controls; but the cost when compared with the mini was almost a trade-off, and the mini provides far greater flexibility.

At that point, the hierarchy in RPD's planning consisted of the minis linked through communications cables to a central computer.

"As we studied this idea, however, we saw it inhibited the very flexibility we were after," said Barnes. "As the number of test stands in the system is increased, the added load is placed directly on the central computer, which reaches its capacity that much sooner.

"Moreover, the polling function in such systems is critical; it requires that the system check each test stand once a second, placing a significant workload on the central computer. It also makes a second backup computer mandatory so that operations can continue if the first system should go down."

System/7s Used

This led to the concept of using small-scale IBM System/7s "between" the satellite minis and the central computer. The System/7s are each capable of monitoring up to 31 test stands.

They do the polling, causing software and other information to be transmitted from the central computer to the individual test stand, as needed, and transmit test and other measurements generated at the test stands to the central system.

The smaller computers also serve as backup.

This means that, even if the central computer should discontinue operating, test operations can continue for about eight hours with full capability. If both the System/370 and System/7s are down, the minis continue operating the stand on the model carburetor it is set up for.

In preparation for use of a general-purpose computer, manufacturing personnel are inevitably thrust into the world of DP software – operating systems, sophisticated control programming, software interfaces, etc.

The alternative is to assemble an in-house staff capable of designing and implementing the complex software or to have it constructed by outside specialists as a one-time job.

RPD opted for something of a middle road. Seven programmers were hired as an in-house staff to concentrate on the applications and functional computer programs.

System programming was contracted to IBM Services on a fee basis. Essentially, the software consists of the OS/VS1 operating system, the Customer Information Control System (CICS) for communications, and software specifically involving the Model 145 and the System/7s.

RPD programmers are doing a limited amount of this work to gain expertise.

"A major advantage of the new system showed up during the installation stage," said Paul H. Grabowski, supervisor of the central system. "We were able to handle applications programming and the related software development concurrently with on-line test work.

"The programmers use the system by means of 3277 visual display terminals. On the earlier system, programming changes have to be made when the system is not in use, such as on holidays and Sundays. Now software development is done during daytime hours and done concurrently with test operations.

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The TMS 9900 Microprocessor

The TMS 9900 is a 16-bit, single-chip microprocessor using MOS N-channel silicon-gate technology. Its unique architecture permits data manipulation not easily achievable in earlier devices. With its repertoire of versatile instructions and high-speed interrupt capability, the TMS 9900 microprocessor provides computing power expected from a 16-bit TTL computer.

The Model 990/4 Microcomputer

It's a complete computer on a single printed circuit board using the TMS 9900 as its central processor. The 990/4 is ideally suited for terminal control, peripheral device interface control, and as a CPU for OEM customers.

In addition to the TMS 9900 microprocessor, the 990/4 microcomputer contains up to 8K bytes of dynamic RAM, up to 2K bytes of static RAM and/or PROM, eight vectored interrupts, front panel interface, real-time clock input, two I/O buses for low- and high-speed devices, and optional ROM utilities.

With the 990/4, you can select a low-cost OEM package, a 7-inch or 12¼-inch rack-mountable chassis, or a table-top enclosure . . . and memory expansion to 58K bytes.

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The most powerful member of the family is the Model 990/10 general-purpose minicomputer. The 990/10, a TTL implementation of the 990 architecture, provides the high-performance speeds demanded in many applications.

A memory mapping feature providing memory protection and privileged instructions supports memory expansion to two million bytes. And TILINE**, an asynchronous high-speed I/O bus, supports both high-speed and low-speed devices. Chassis options are the same as those for the 990/4.

Price: With 16K bytes of memory, chassis, power supply and programmer's panel, the Model 990/10 minicomputer is only $1968*.

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In addition to the family of compatible hardware, Texas Instruments backs you with complete software and support. ***Standard software packages include memory-resident and disc-based operating systems;*** FORTRAN, COBOL, and BASIC compilers; and program development packages with utilities. And, for you to develop application programs for the 990/9900 family, we offer ***cross support on timesharing networks*** and standalone software development systems. One is a low-cost system using the 990/4 . . . the other is a disc-based system using the 990/10. And, a ***prototyping system*** is offered for TMS 9900 users to develop custom software and firmware modules.

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Mass Storage Benefits Depend on User Requirements

(Continued from Page 33)

Typical early IBM System 360 installations needed only three to five 2311 disk drives (total of 25M bytes) for systems residence and scratch storage, since most of their data bases were retained off-line on magnetic tape.

Four years later (1970), these installations had moved important applications – batch and on-line – to disk and were utilizing two to four 2314 facilities (total of 500M bytes) for all random-access functions, with tape playing a continually diminishing role.

By this year, many large installations had migrated even further to on-line storage, utilizing five to 10 3330 disk facilities (total of 10 billion bytes).

Although appetites for on-line storage must ultimately level off, it seems probable that 2,000 to 3,000 installations worldwide will each require one or more trillion-bit devices by 1980.

So far, we have avoided the "gray area" of storage requirements cited above: 5 billion to 20 billion on-line bytes. It is premature to offer a recommendation for installations in this category, since their choices will depend on the degrees of success achieved by IBM and especially CDC, whose mass storage system device is sized for this market.

The IBM, Ampex and Precision Instruments devices are sized for installations requiring at least 20 billion bytes, although a minimal Ampex system furnishes 11 billion bytes.

Should IBM or CDC succeed in delivering a reliable mass storage system with good responsiveness, software support and so forth, one would not hesitate to project for them a large share of this intermediate-sized market.

IBM has been selling 3850s primarily as replacements for magnetic tape, typically for libraries of a few thousand master-file reels. To date, few IBM installations have planned to replace many disk subsystems with 3850s, even though IBM's announcement and promotional literature emphasizes the reliability and cost-effectiveness of 3850s for on-line disk-oriented applications.

In fact, the principal reason for IBM's announcing their Virtual Direct Access Storage concept earlier this year is to support the 3850 in a convenient, disk-like manner.

Principal Contenders

CDC and NCR founded a card/tape peripherals manufacturing firm, Computer Peripherals, Inc. (CPI), approximately three years ago. CPI has the mass storage system development and manufacturing responsibility for its parent companies – recently expanded by International Computers Limited's buying into CPI – and it will also meet mass storage needs of other firms in peripheral-equipment partnerships with CDC such as Honeywell.

Ampex has developed its Terabit memory over the past eight years, and several units have been delivered to federal agencies. Ampex has continually adapted its basic Terabit memory videotape transport to current-line operating systems from IBM, Digital Equipment Corp., etc.

At present, Ampex is developing software necessary to operate its memory with IBM's OS/VS operating systems.

Ampex now has off-the-shelf hardware/software memory capability for major mainframes from IBM, DEC, etc.

Delays in delivering mass storage systems have been due as much to customer slowness in setting up suitable operating environments as to hardware/software problems of the manufacturers.

Factors precipitating serious consideration of a major change in file storage are typically imminent exhaustion of computer-room space or imposition of an enormous new application on an installation.

The principal gains from mass storage are projected to be as follows, in approximate order of importance: reduction of file storage space – floor space for drives, shelf space for reels and packs; automated management of mass storage cartridges/reels, rather than haphazard, error-prone manual handling of tape reels; and, ultimately, reduction of file storage costs, subsequent to a major conversion of on-line disk storage to mass storage at an installation.

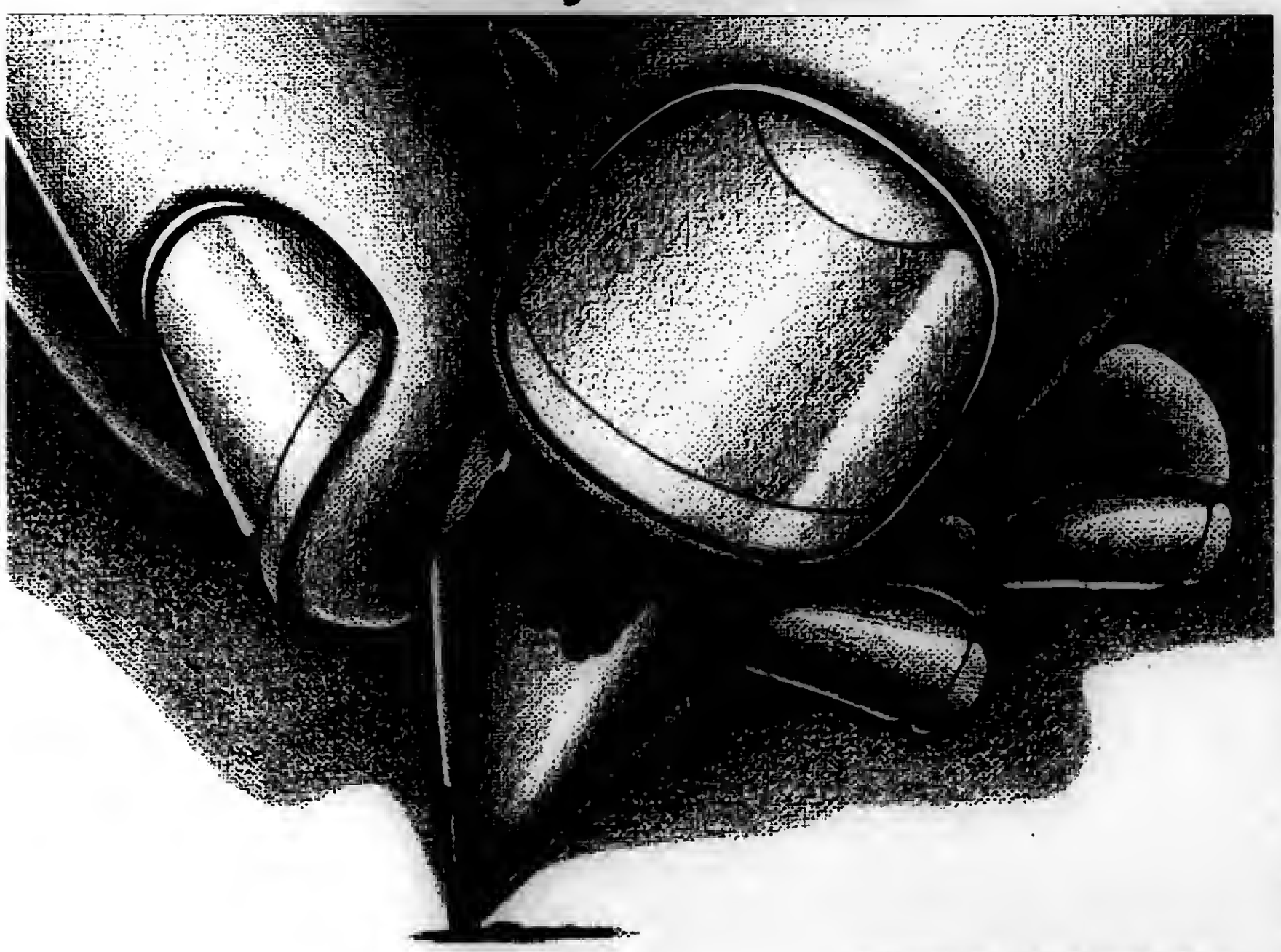
It seems unlikely a mass storage system will reduce operating costs so long as it only replaces part of the magnetic-tape library and drives. Furthermore, half-inch magnetic tape is such an entrenched standard it is difficult to foresee IBM's mass storage cartridge displacing tape within the next two decades.

Finally, one must remember how slowly the large VS operating systems are being accepted by IBM customers. Counterparts from other computer manufacturers are faring little better.

Whatever the causes, slow acceptance of OS/VS implies even slower acceptance of IBM's mass storage devices, since the latter are software-supported only by the former.

Freeman is a senior associate at Ketron, Inc. in Wayne, Pa.

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A simple case underlines the point. A major telephone company installed a Bell & Howell Intelligent Mark Reader terminal to process trouble reports and dispatch repair crews. As information is received on the phone, a tab-card trouble report is marked by pencil, placed in the IMR terminal, and automatically checked for errors. The information is then reformatted and transmitted to a central computer where the data is routed to the appropriate service center. The IMR terminal takes 3 hours to provide 100% error-free data entry. The same job originally required 40 hours manual keying, with an unknown error factor. The per-installation salary savings are about $1000 a month. Valuable connect-time requirements dropped from 15 hours monthly to one hour – a savings of around $170 a month per installation. Think of these savings for every one of 28 installations!

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Mini Bits

Diva Unwraps Lower Prices For Intelligent Controller

EATONTOWN, N.J. – Diva, Inc. has unwrapped new lower pricing for its intelligent controller, Computroller III, and related products.

The pricing for the Mass V systems (DD-50, DD-52 and DD-54) with 27.3M to 82.1M bytes per spindle are, $13,600, $16,000 and $17,400, respectively.

Add-on disk drives for the Mass V series systems range from $6,500 to $9,500. The standard Computroller III has 8K bytes of memory buffering.

These systems are presently compatible with Digital Equipment Corp.'s PDP-11, Data General Corp.'s Nova and Eclipse and Interdata's CPU product lines.

PDP-11-Compatible Prom Expanded

TROY, Mich. – System Associates has announced expanded programmable read-only memory (Prom) capabilities.

To the existing 1K-word Proms compatible with the Digital Equipment Corp. PDP-11, customers can now order Proms from 1K words to 8K words in increments of 1K.

The 8K Prom is priced at $2,000, while the 1K Prom costs $600.

The Prom uses one slot.

The firm is located at 55 Park St.

8080 Designers Get Manual

WALLINGFORD, Conn. – Northeast Services, Inc. has announced a Mycro-Tek 8080 design manual written for the hardware designer. The design manual emphasizes hardware definition and design and covers 8080 signal definition, timing and state transition, memory configurations, control panel design, use of an 8080 Proto-typing Board (available for $750 in quantities of one) and a standard 210 control panel.

It is priced at $24.95 from the firm at 34 Highland Ave., 06492.

Brochure Describes Applications

PALO ALTO, Calif. – "HP Math" is a brochure that describes the applications of the HP Math software packages. It is available without cost from the Hewlett-Packard Co. at 1501 Page Mill Road 94304.

Mini Applications Seminar Topic

WASHINGTON, D.C. – "Minicomputers: The Applications Explosion" is the title of a three-day seminar to be presented by the Amerlean Institute of Industrial Engineers (AIIE) here Nov. 17-19.

Information is available from AIIE Seminars, P.O. Box 25116, Los Angeles, Calif. 90025.

Monitors Device in Calves

System Aids Artifical Heart Study

PALO ALTO, Calif. – At the Stanford University School of Medicine, a recently installed minicomputer is helping to evaluate the functions of an implantable artificial heart that ultimately is intended to assist the failing human organ.

In the project, sponsored by the National Institute of Health, the artificial heart-assist device and its power source are implanted in calves and monitored by the computer to get the needed physiological data on its performance.

"The minicomputer is a critical part of the necessary instrumentation designed to observe what is going on during and after implantation," according to Dr. Allan K. Ream, assistant professor at the medieal school's department of anesthesia.

"Although the measured parameters change from experiment to experiment, we typically monitor pressures in the arteries, veins and the chambers of the animal's heart."

More data is gathered by measuring arterial flow to the lungs and near the bypass device as well as the heart rate received from the electrocardiogram. This resulting information is then used as the basis for calculations of about 30 variables.

"The immediate use of the minicomputer system is to monitor the performance of the new heart device. However, there is a long-term interest in its development as the prototype of an operating-room monitoring system for human heart surgery that is more cfficient than those currently available," Ream said.

The Hewlett-Packard (HP) system used in the tests consists of a 21MX minicomputer with 16K bytes of semiconductor memory; a 5M-byte disk; a 16-channel, single-ended input analog-to-digital converter; and a CRT terminal which serves as the system's console. Printed copy is obtained from a line printer shared with another university department.

"The computer is also used to analyze the voluminous data for us," Ream said.

The present $24,000 system is being expanded to include plotting capabilities and a larger 32K-byte memory.

Decision Data System/3 Printers Available for Use on Model 8

HORSHAM, Pa. – Decision Data Computer Corp.'s 6603 and 6606 line printers, recently introduced for System/3 Model 10, are now available for use with System/3 Model 8 eomputers, according to the firm.

The 300 line/min and 600 line/min printers are available as direct replacements for the IBM 5203 printer used on System/3 Model 8 computers.

With monthly rentals as low as $410, the 6603 can provide substantial savings for Model 8 users requiring 300 line/min printing, according to the firm.

In addition, the 6606 printer currently represents the only way a Model 8 user can obtain 600 line/min printing, as IBM offers only the 5203 printer on that system, and its top speed is 300 line/min, the firm said.

Monthly rental prices for the 6603 and 6606 System/3 printers, including maintenance, range from $410 to $825 depending upon contract term and model selected. Purchase prices range from $18,150 to $25,220.

Wangco Introduces Disk Drive Series

LOS ANGELES – Wangeo, Inc. has announced a series of cartridge-type magnetic disk drives.

Designated the "Super" series, the drives feature front-loading (2315-type) and top-loading (5440-type) models, using the removable disk cartridge and an internal fixed disk.

Capacities are available from 2.5M bytes to 25M bytes, recording 100 track/in. and 200 traek/in., with recording densities as high as 4,400 bit/in. in the top-loading models, Wangco said.

The Super series uses a recently developed brushless DC motor, which is an integral part of the disk spindle. No belts or pulleys are used in the drive system, the firm said.

Wangeo is at 5404 Jandy Place.

At Iceland University

Freshmen Have 'Friend' in Mini

REYKJAVIK, Iceland – Here at the University of lecland, the Department of Computer Services recently reported its IBM 1620 – installed in 1964 – is still going strong . . . but the emphasis on its use has shifted from that of a general-purpose machine to that of the freshman's "friend."

The 1620 was the first general-purpose machine to be introduced in Iceland. Because of increasing use, the original configuration of the university's machine was expanded to include 40K bytes, two 1311 disk drives, a 1622 card reader/punch and a 1443 printer.

While the research load at this 4,000-student university has shifted away from the 1620, with bigger mainframes becoming available for that purpose, the 1620 has inereasingly become the "friend" of first-year students, who appreciate its simplicity of operation and are not seriously affeeted by its limitations.

During the winter semester of 1975, close to 9,000 student jobs were processed that way, along with some 2,500 other jobs, mainly small research jobs.

Aecording to Dr. J. Thorhallsson, head of the Department of Computer Services, plans are being fomulated to retire the 1620 in the not-too-distant future.

But the philosophy of allowing the students to "operate" the real thing will prevail and play an important role in the selection of new hardware, he said.

DEC Graphics System, Configuration Debut

MARLBOROUGH, Mass. – An interactive graphics display subsystem, which is the base of a graphics hardware configuration, has been announced by Digital Equipment Corp.

Called the VS60, the subsystem is designed as an add-on for any PDP-11 computer.

The VS60, a high-speed analog stroke system, has a 21-inch (53 cm) CRT, light pen and a graphic processor, the display processing unit.

The first configuration incorporating the VS60 is designed as an intelligent graphics terminal. Called the GT62, the configuration includes the VS60, a PDP-11/10 minicomputer, a free-standing Ascii keyboard and provisions for communication links.

The VS60 display subsystem is priced at $38,800; the GT62, at $47,500.

The VS60 will be supported under both the RT-11 and RSX-11 operating systems with a Fortran graphics subroutine package.

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Company Uses Minis to Test Space Shuttle Fuel Tanks

NEW ORLEANS – Martin Marietta's Acrospace Division here is employing two minicomputers to perform structural tests and to simulate flight conditions to test the electronic subsystems of a space shuttle's external fuel tanks.

The giant, expendable external tanks to be built by the company will contain the liquid oxygen and hydrogen fuel for the three main engines of the space shuttle.

The space shuttle, which is scheduled for flights throughout the 1980s, will consist of two other main elements – the airplane-like space vehicle itself, called the orbiter, and the recoverable twin solid-rocket boosters.

Using two Varian Data Machines V73 minicomputers, the structural tests of a prototype of the external tank have already been completed. Currently, the company is engaged in developing the programming necessary to simulate the operation of the orbiter.

By simulating its functions, the computers will be used to check out the electronic operation of the external tank and assure compatibility of data communications when full-scale preflight tests are ready to begin.

With the space shuttle, the U.S. will enter a new phase of earth and space exploration and space transportation. It will be designed to transport a variety of space vehicles such as a space lab and communications satellites into orbit at a reduced cost. A two-week turnaround time is the goal for reuse of the space shuttle orbiter.

On a standard mission, the orbiter will "blast off" like a rocketship; remain in orbit like a satellite for seven days, delivering its payload; return to the earth's atmosphere, land like an airplane; and be readied for another flight.

Two launch sites are planned – Vandenberg Air Force Base in California and the National Aeronautics and Space Administration (Nasa) John F. Kennedy Space Center in Florida. The first flights are planned for 1979.

Simple Production Essential

Of special consideration is the fact that the external tank must be designed for simple production. The shuttle is expected to make 445 flights between 1979 and 1990, with a maximum of 60 flights per year. The expendable external tanks must, therefore, be mass produced in comparison with the production rate of any space hardware to date.

Resembling the fuselage of a DC-9 aircraft, the tanks will be 158 feet long, 28 feet in diameter and carry 1.5 million pounds of fuel and oxidizer.

It is to be totally constructed of aluminum alloy skin and support or stability frames. The sidewalls and end bulkheads will be thick, plate stock; the skins are to be butt-fusion-welded together to provide reliable sealed joints. The skirt aluminum structure will use skin/stringers with stabilizing structures.

The first task for the mini system has been in testing the scale models of the external tanks supplied by Nasa to Martin Matietta. The external tank model, 36 inches in diameter by five feet long, constructed of aluminum for strength and light weight, was tested structurally using approximately 120 strain gauges.

The gauges were placed, 60 inside the tank and 60 on the outer skin, to focus attention on those areas expected to experience the heaviest stresses, such as curved, seamed and thinner walled areas.

The tank was pressure-loaded with gaseous nitrogen in 20% of rated load steps and held. The mini "read" the gauges, logged the data and produced printouts of the stress in real time. A signal conditioning subsystem, with capacity for 64 channels and containing A-D conversion and signal amplifying circuitry, was used.

Simulation Studies

The simulation studies to be performed with the external tank entail using one computer to "look like" the orbiter itself in terms of communications. That is, the computer is being programmed to send and receive signals to and from the tank subsystems. This will enable Martin Marietta to validate the design of the external tank.

Sensors located in the external tank convert the physical data into electrical signals. These sensors include pressure, temperature and acoustic transducers, as well as accelerometers, calorimeters and radiometers (heat-measuring devices).

Frequency modulation and pulse code modulation telemetry techniques are then used to condition and multiplex the signals which are sent to the computers on board the orbiter or, in this case, to the computer, which takes exactly the same actions and makes the same decisions the actual flight computers will make.

The simulation checkout test will take about 16 hours to perform, since there are a host of steps and events that must take place even before the actual mating of the tank to the rest of the shuttle. The complete simulation program is expected to be completed by early 1977.

During the first test flights of the external tank, about 380 different measurements will be taken by computers on the orbiter. During ground test simulation, that many will also be taken. Once the shuttle flights are well under way and operational, only about 40 measurements will be necessary.

Each of the two Varian V73s contains internal memory space for 24K words plus a shared memory of 8K which operates between both processors.

The first computer performs in a data acquisition mode, storing collected data onto magnetic tapes. A disk subsystem with a capacity of 5M words contains the reference data – that is, the expected results.

The magnetic tapes are then placed on the other computer for data reduction, analysis and printout of results. This two-step process economizes memory space, H.R. Stunkard, project engineer at Martin Marietta said. To perform it in one step would entail use of about 100K of memory, he said.

The shared 8K memory contains both the Varian executive operating program and also is used to collect some portions of the test data.

The dual processing system also includes two disk drives with 2.35 million words each, three magnetic tape units, a line printer, card reader, two CRTs and a cassette drive terminal. A Varian high/low level analog input system (having 64 channels now, but to be expanded to 512 channels) is used for signal processing of strain gauge data.

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For Population Council

Mini Copes With Increased Workload

NEW YORK – When the Population Council here decided to upgrade from its IBM 1130, it went the mini route instead of the medium-scale way.

The nonprofit foundation concerned with the field of population turned to a Digital Equipment Corp. PDP-11/45 to cope with the increasing workload that was saturating the installed system.

The need for DP first became evident in the late 1960s. The council, which had been established in 1952 for research, training and technical consultation in population-oriented studies, was inundated with data as the result of a number of international surveys. The only quick and efficient way to reduce the data was through computer analysis.

Initially, the Population Council tried to have the data processed by the traditional method of batch processing in a DP center, but this proved to be too restrictive. A normal DP center employs a methodology that results in a long turnaround from the time data is first prepared until the final processed data is returned to the researcher. Further, there was no rapid and direct communication between computer and computer user, which tended to result in further delays in obtaining data in the precisely required form.

The first computer system installed at the Population Council's facility was the IBM 1130, which employed magnetic tape units to store data. The computer system was considerably more effective from the standpoint of obtaining data in a desirable turnaround period, and the demand upon it grew.

While the computer system was installed in July of 1971, by fall, it was obvious the only way to keep up with the increasing demand would be to upgrade the computer facilities in some fashion.

A grant of $200,000 was made available to permit the DP facilities to be improved, and investigations were undertaken to determine the most effective approach. Having had experience with 1130 systems, serious consideration was given to employing an upgraded 1130 system with more internal memory and more rapid and higher capacity external data storage devices.

Analyses of the proposed upgrade revealed it would have a limited growth potential, should further expansion be required – as trend analyses indicated might occur. Further, many users found the 1130 system relatively inflexible for the variety of jobs they required.

During the investigation for alternatives to the then-installed 1130 computer system, the Population Council discovered that the characteristics of minicomputer systems enhanced their desirability. A number of them had operating systems – software – that permitted some users to employ batch processing stations on the same system where others were employing time-sharing terminals interactively.

Other software features on some minicomputer systems included schemes to permit address of large amounts of memory and utility programs.

Both software and hardware considerations made minicomputers seem a favorable alternative to an upgraded 1130. While the individual hardware and software options were impressive, perhaps the most important consideration was that most minicomputer systems are modularly expandable. Thus, the minicomputer systems could be developed to fit immediate needs without either requiring the purchase of more equipment or software than was immediately required or raising concern that a configuration would be likely to limit further growth, according to the council.

System Speeds Production At Synthetic Fiber Plant

ANDERSON, S.C. – The Dow Badische Co. has installed three minicomputers at its nylon and polyester plant here to speed the production of synthetic fibers and to help with the automation of manufacturing processes.

One of the minis analyzes the operation of yarn-texturing machines in the plant's carpet-fiber operation. The second is used in process-development work, aimed at developing on-line techniques for monitoring and controlling the production of nylon fiber. The third controls the labeling and shipping of the plant's product.

All three are HP9600 systems from Hewlett-Packard.

Frank Fulton, who supervises the manufacturing systems group within Dow Badische's computer service department, pointed out that product uniformity is a primary consideration in the processing of carpet fiber.

This uniformity must be reflected not only in the fiber's objective properties – such as diameter and surface qualities – but also in properties that are more difficult to assess, such as "bulk" and "hand."

The importance of these elusive properties and the problems associated with measuring them have impeded the development of computer-control systems for the manufacture of extruded-polymer yarn, Fulton said.

Using a Hewlett-Packard 9600, Dow Badische engineers are investigating on-line data-acquisition and control techniques that could be used in a yarn-processing system. Such a system would include special sensors that would measure the yarn's more esoteric characteristics directly or indirectly.

At the same time, another HP 9600 is analyzing operating data – such as process temperature and throughput – from the plant's texturizing machines. This information is gathered by a data logger, which passes it to the HP 9600 in response to selective queries by the computer.

The HP 9600 analyzes the data statistically and searches for data indicating that a process variable might move beyond acceptable limits. If such a trend is found, a warning on a hard-copy terminal is printed to advise plant employees to make a correction.

At the end of each shift, the computer generates a statistical report derived from all of the data logged during the shift.

These reports can be used in correlating process conditions with the properties of a batch of fiber, as measured off-line in laboratory tests.

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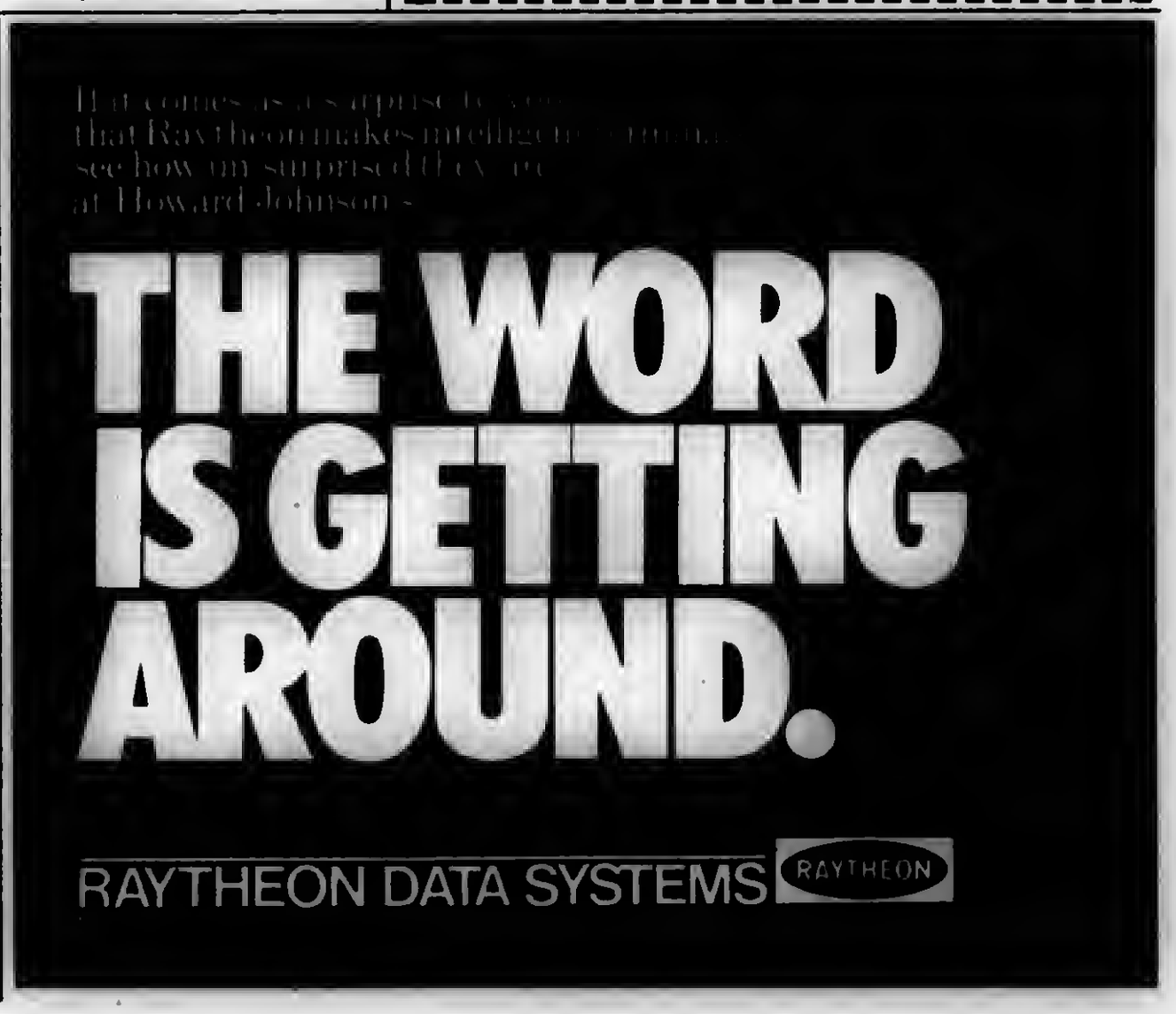
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Calendar

Nov. 17-19, New York – The Second Annual Computer Security Conference & Workshop. Contact: John C. O'Mara, Computer Security Institue, 43 Boston Post Road, W. Main St., Northboro, Mass. 01532.

Nov. 19-21, Las Vegas – 1975 Systems Engineering Conference. Contact: Jim F. Wolbrink, Institute of Industrial Engineers, Inc., 25 Technology Park, Atlanta, Ga. 30071.

Nov. 19-21, Austin, Texas – 5th Symposium on Operating Systems Principles, Contact: Dr. A. Ambler, Department of Computer Sciences, The University of Texas at Austin, Texas 78712.

Nov. 20-21, Palm Springs, Calif. – Technical Meeting on Prielng Computer Servlces (TMPCS), sponsored by the Special Interest Group for Measurement and Evaluation (Sigmetrics). Contact: JoAnn Lockett, Sigmetrics TMPCS, c/o Information Sciences Department, The Rand Corp., 1700 Main St., Santa Monica, Calif. 90406.

Nov. 24-25, Asheville, N.C. – National Association for State Information Systems (Nasis) Southern Regional Meeting. Contact: Nasis, P.O. Box 11910, Lexington, Ky. 40511.

Dec. 2-3, Washington, D.C. – 1975 Seventh National Transportation Systems Forum. Contact: Transportation Data Coordinating Committee, 1101 17th St., N.W., Suite 309, Washington, D.C. 20036.

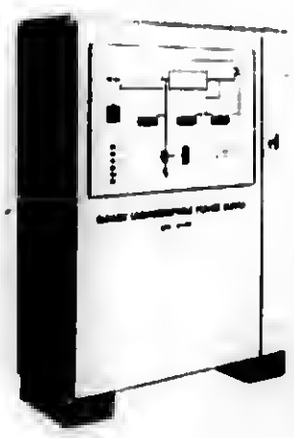
Dec. 3-5, Denver – 1975 Cause National Conferenee, with the theme "Higher Education Information Systems: The Challenge of Change." Contact: Cause National Office, 737 29th St., Boulder, Colo. 80303.

Dec. 3-5, Washington, D.C. – "Government Computer Applieations," sponsored by the American Institute of Industrial Engineers (AIIE). Contact: AIIE Seminars, P.O. Box 25116, Los Angeles, 90025.

Dec. 18-19, Sacramento, Calif. – 1975 Winter Computer Simulatlon Conferenee, sponsored by the Society for Computer Simulation. Contact: O.S. Madrigal, Department of Computer Science, California State University, Chico, Calif. 95929.



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Hammer, Winkler to Lead NCC Steering Committee

MONTVALE, N.J. – The Steering Committee for the 1976 National Computer Conference (NCC) will be headed by Dr. Carl Hammer, conference chairman, and Dr. Stanley Winkler, program chairman.

Other Steering Committee members are Edward Zimmerman, bicentennial coordinator; Jackie Potts, computer graphics art exhibit; Norman Moraff, finance; Dr. Sema Marks, Student Computer Fair; Colonel William F. Luebbert, Historical Perspectives; Ronald Winkler, Esq., Legal Counsel; Ruben Maldonado, conference operations; Dr. Henry McDonald, NCC Committee liaison; Joyce Amenta, publications; Dorothy Ray, public relations; Adrian Basili, Science Film Theater; Thomas D'Auria, special activities; Lee Danner, special assistant; Cecil Shelton, secretary; Evelyn Bonney, awards; and Thomas Johnston, exhibits.

The 1976 NCC will be held June 7-10 in New York City. For further information contact: '76 NCC, c/o the American Federation of Information Processing Societies, Inc., 210 Summit Ave., Montvale, N.J. 07645.

Married Team Earns Citations

LOS ANGELES – The College of Engineering of the University of Wisconsin-Madison has conferred Distinguished Service Citations on a husband-wife team, Dr. Gerald Estrin and Dr. Thelma Estrin, both faculty members of the University of California (UCLA).

It was the first time in the 28-year history of the award that a husband-wife team has been chosen.

Dr. Thelma Estrin, director of the Data Processing Laboratory of the UCLA Brain Research Institute, was selected for "her pioneering work in the application of computers in biomedical research," while her husband, UCLA professor of computer science, was cited for "his internationally recognized work as a university teacher and researcher in the design and construction of computers."

Both Estrins were also cited for their key roles in developing the Weizac computer in the early '50s at the Weizman Institute of Science in Israel, the first large-scale computer developed outside the U.S. and Europe.

Societies/ User Groups

SCDP Headquarters Moves to U.S. Capital

HUDSON, Mass. – The Society of Certified Data Processors (SCDP) has relocated its headquarters to Washington, D.C.

Operation of the Washington headquarters in Suite 810 at 500 12th Street, S.W., is under the day-to-day supervision of Wayne J. Smith, named by the society to the new position of executive director.

Call for Papers

ASSOCIATION FOR COMPUTING MACHINERY (ACM) SIGPLAN/ SIGGRAPH SYMPOSIUM ON GRAPHIC LANGUAGES, April 26-27, Miami.

The ACM Special Interest Groups on Programming Languages (Sigplan) and Computar Graphics (Siggraph), in cooperation with tha Florida Intarnational University, is sponsoring tha symposium.

Some suggestad topics for papars ara languagas for animation, scane analysis, picture processing and extensions for graphics; graphic subrouting packages; and languages for writing interactiva graphic systems.

A tirst dratt of no more than 5,000 words should ba submitted by Oec. 15 to Dr. Toby Berk, program chairman, Department of Mathamatical Sciencas, Florida Intarnational Univarsity, Miami 33144.

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Announcement in Few Weeks

Burroughs Plans 800 Family Spanning Product Range

By Edith Holmes
Of the CW Staff

NEW YORK – Within the next few weeks, Burroughs Corp. plans to announced the first unit of a new family of computers spanning the range from small to large, Ray W. Macdonald, chairman of the corporation's board, told a meeting of the New York Society of Security Analysts here recently.

The first system, in the medium-scale category, is a multiprogramming system designed primarily for data communications and decentralized processing networks. It will have up to three times the workload capacity of the most powerful medium-size systems Burroughs currently has in volume delivery, Macdonald said.

"Users of the B2500 and B3500 systems introduced in the 1960s did not require reprogramming to use the improved power of the B3700 or B4700 first delivered in 1971," he noted. Similarly, users will also be able to move directly to the forthcoming 800 series without reprogramming.

Macdonald said the first of the 800 systems will be at the top of Burrough's medium-scale category, is now in production with customer deliveries scheduled in the first quarter of next year and will be generally competitive with IBM's 370/135.

During the second quarter, Burroughs plans to announce its next large-scale computer system, which will belong to the 800 family and will be fully compatible with all B6700 and B7700 systems, he added.

The 800 computers will be more compact in size than Burrough's current systems, reflecting extensive use of high-density microcircuitry in the processor, memory and input/output modules, Macdonald stated.

In addition, Burroughs plans in early 1976 to introduce a series of small systems to strengthen its position in this market as well. In production with test installations already in place, this series employes advanced LSI circuitry and processing techniques, according to Macdonald.

The third quarter of next year will see announcements from Burroughs for systems in the intermediate- to medium-scale category.

Peripherals Planned

Burroughs will also introducc peripherals for the systems in the 800 family next year. Among these will be high-capacity, high-speed disk systems to support interactive processing against large-scale data bases, Macdonald said.

By the fourth quarter, product announcements will include other disks and high-speed printers, he added.

In reviewing the existing product line, Macdonald observed orders for the B700 line received impetus from IBM's introduction of the System/32.

"The happy introduction of IBM's System/32 has added additional stimula-

(Continued on Page 45)

PTT, Mainframe Plans Concern Europeans

By Andrew Lloyd
Special to Computerworld

MUNICH – While most of the exhibitors here at Systems 75 were preoccupied with the way their markets are likely to develop in 1976, two major issues dominated the conference.

The first was the European mainframe manufacturing strategy and the plight of Siemens after the apparently imminent breakup of Unidata. The second was the rift between the German Post, Telephone and Telegraph (PTT) authority on the one hand and users and private suppliers on the other.

In the opening speech at the conference, the Bavarian minister for economic affairs and transport, Anton Jauman, urged concerted efforts be made on national and European fronts to strengthen the market position of the national computer manufacturers.

He also attacked the French and British methods of supporting domestic industry by guaranteed orders. "The successful firms outside Europe have founded their success on dynamic leadership and effective motivation," he said.

Concerning Siemens, it is thought Siemens is relying on future models of Unidata computers for its next range. This would put it in a difficult spot if the new Compagnie des Machines Bull management structure decides to stop development of the Unidata machines.

All the talk is of a link-up between Univac and Siemens, but observers say the possibility that Compagnie des Machines Bull may be dangling an attractive carrot to Siemens cannot be overlooked – despite what seems to, be intense German political annoyance that the French dropped out of Unidata.

PTT Unresponsive

At a telecommunications seminar, a representative of the German PTT responded to charges it is unresponsive to user needs.

A survey of 25 users' reactions to the PTT showed discontent, according to Klaus Dieter Kreutzer, general manager of Alldata-Service GmbH, Munich, who took the survey after a fight between users and the PTT last year.

CW at Systems '75

In a paper entitled "Restrictions Imposed by the PTT and Their Economic Impact," Kreutzer observed, "The degree of dissatisfaction was much higher than I had anticipated. The sample may be too small to be a sound statistical base, but it acted as a pointer."

Users' discontent stemmed from several PTT announcements last year of regulations restricting modem supply by private companies. Feelings ran so high there were parliamentary debates and several lawsuits in the summer.

"This is not a healthy way to carry on discussions with the PTT," Kreutzer said.

The PTT should make efforts to market its services rather than just distribute them, he recommended.

The PTT representative, Roswitha Wolf, listed some of the disadvantages of being a monopoly – like having to provide very unprofitable services.

In response to a demand for 24-hour

(Continued on Page 46)

Canadians' DP Business Good Despite Economy

By Nancy French
Of the CW Staff

TORONTO – The business climate for the sale of minicomputer systems and peripherals in Canada has been excellent for the past two years despite inflation and the worldwide recession, vendors said at the Canadian Computer Conference here recently.

However none would predict what effect the recently imposed federal wage and price controls would have on business in the months to come.

With the cost of living up 12.5% in the last months and unemployment hitting 9%, "economic conditions that confront the average guy here are just as bad if not worse than in the States – but the worse times are, the easier it is to sell computers," Paul Eckland, general manager for General Automation Computer, Ltd. explained.

"Companies are looking for ways to save money and automation is one of them," Eckland noted.

The emphasis on communications is a very significant part of the computer environment in Canada, according to Martin Durbec, national sales manager of Singer Business Machines.

"Computing is getting down to the people here," he pointed out. With the emphasis on processing and distributed proc-

CW in Canada

essing, "the peripherals and terminals part of the business is very buoyant."

Ron Boguski, Toronto branch manager for Inforex, agreed. "People are looking at different ways of saving money and more editing at the source is one way of reducing overhead," he explained.

Inforex, which concentrates its sales efforts on the Toronto metropolitan area, is emphasizing remote data entry equipment as well as its System 5000, which offers data base storage capabilities without the need for an on-line data base environment.

Dick Weber, manager of marketing communications for Data General (Canada) Ltd., said that firm's sales figures tell the story. Revenues from Canadian sales have grown 30% in 1975 – the same rate as in the U.S.

Technologically, "there is a strong parallel between the two countries, with Canadians exhibiting no gap in applications at all," he said.

Data General's new product line has helped, according to Weber, who said the company's C/300 has done very well here in a relatively soft market. The Nova 3 has been doing very well in the Canadian OEM market as well.

Better Than in U.S.

Mike Naggiar, Ontario district manager for Hewlett-Packard Co., said his firm's business is "holding up pretty well – in fact better than in the U.S. domestic market."

Sales are particularly strong, with a trend toward data base management, order entry and inventory control on minicomputers, he explained.

Users who want to go on-line are installing minicomputers and terminals in

(Continued on Page 45)

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Climate for DP Sales Excellent Despite Economy, Canadians Say

(Continued from Page 43)

remote locations and connecting them to large batch machines they already have in central offices, he said.

Bob Lundvall, sales manager of Digital Equipment Corp. of Canada Ltd., said DEC's business, too, has improved a lot, growing from $27 million in 1974 to $41 million this year.

Concurring with Naggiar's assessment, Lundvall added the market has also expanded in process control functions and for such things as peak power monitoring.

"Savings justify the expense for investment in a minicomputer," he said.

Others showed little concern for any further downturn.

M.S. Sev of Ampex of Canada, Ltd. remarked that while curbs on spending may affect government business, vendors don't stand to lose much on commercial accounts.

"A DP manager can always find the money to buy an extra disk drive," Sev remarked.

In addition, Ampex's entry into the OEM market here, which is tiny by U.S. standards, will help boost sales without the additional expense for market expansion Ampex involved itself in a few years ago.

"In 1969 and 1970, when we started our end-user operation, we were nationwide, and support was a problem. Now we concentrate on business in Toronto, Ottawa and Montreal," leaving business in western Canada to other vendors, he said.



Eckland



Durbec



Naggiar

CW Photos by N. French

Many companies here apparently have that same attitude, according to visitors on the floor from remote locations who said that, with the exception of IBM, "vendors don't come to us, we have to go to them" by visiting shows like this. The show drew more than 7,000 visitors from all over the country.

International Computers of Canada Ltd. (ICCL) is pressing forward with its 2903 general-purpose computer, offering it on a rental instead of purchase basis as a means of competing for a piece of the distributed computing market.

ICCL President T.W. Randall explained the firm received orders for 14 systems last year, the first year the 2903 was sold here, and "we're looking to double that this year."

Olivetti Focuses On Terminals

TORONTO – Housed in one of the largest exhibit spaces on the floor of the Canadian Computer Conference, Olivetti Canada Ltd. displayed a full line of terminal equipment which has had a "good reception in the Canadian marketplace," according to Ance Thatcher, district manager for the Italian firm.

"It was relatively easy to expand from an office products line into terminals," he said. "The competition is not as strong as it might appear."

The terminal business is not a hardware business but rather one of support systems and customer engineering, he pointed out.

With a full field engineering staff of 450 nationwide from its office products line to lean on and the means to maintain a full parts inventory in place, Olivetti's transition has not been too difficult, he said.

Olivetti has penetrated the marketplace here three times deeper than it has in the U.S., and that is justifiable, he noted, because American firms like to buy from other American firms.

Burroughs Planning 800 Series Family

(Continued from Page 43)

tion to this market sector and, in the third quarter, our orders for the B700 were two and one half times higher than in the first quarter, when the System/32 was released," he commented.

"We expect a continued strong rise in B700 order levels into the first half of next year," he added.

Burroughs expects modest growth in both revenues and earnings in the fourth quarter of this year and the first half of 1976, the security analysts learned.

"We look for an improvement in growth in the second half of 1976 and a resumption of good to very excellent growth in 1977," Macdonald said.

Macdonald told the group about Burroughs' acquisition this year of Graphic Sciences, a firm which manufactures equipment under the trademark of "Dex" for transmitting and receiving documents by communications lines.

"More recently, we entered into a definitive agreement for acquisition of Redactron Corp.," which makes word-processing systems, CRT monitors, cassette and cartridge drives and magnetic card units.

"The technologies represented in Redactron and Graphic Sciences products complement those of Burroughs, and there are commonalities in engineering and manufacturing from which we can derive future cost-effectiveness in product development and production," Macdonald said.



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Swift Manager Says

Monitoring of Network Contracts Vital

By Andrew Lloyd
Special to Computerworld

MUNICH – Make sure a monitoring method is included as part of your contract with suppliers, warned Frank Holz, planning manager of the Society for Worldwide Interbank Financial Telecommunications (Swift) project.

In a lecture highlighting some of the problems of constructing an international data network, Holz urged users to keep project control methods and management methods as simple as possible.

The Swift net links most of the European countries with two computer centers in Brussels, Belgium and Amsterdam, The Netherlands.

The 200-man-year project will eventually enable member banks in 15 countries to handle 300,000 international transaetions per day.

Offering a list of guidelines for other network planners, Holz said that not following these rules had led to problems for both Swift and its suppliers.

Areas that required careful planning were the computer sites, the system hardware, data communications, the conversion of user banks to standard methods system software and the preparation of user banks to connect to the network.

Holz said the general principles in planning and control adapted by Swift which should be applicable to large DP projects of many sorts were to:

- Establish the functions of the network early in the development process.
- Determine traffic volumes and provide a means for keeping them up to date. They will change.

CW at Systems 75

- Be as literal and formal as possible when developing specifications.
- Coordinate closely with ordering and regulating bodies.
- Be conservative with estimates of time.
- Carefully monitor progress of all contracts and include the monitoring method as part of the contract wherever possible.
- Make project planning tools formal and an integral part of the development process. Keep it simple.
- Identify priorities.
- Never assume.

Exhibition International in '77

Special to Computerworld

MUNICH – Despite a cutback on some facilities for foreign visitors at Systems 75, the next Systems, in 1977 will be truly international, according to exhibition organizer Gerd Vom Hoevel.

Translation facilities were reduced at the user conferences this year because demand at the previous Systems (1973) had not been very high, organizers said.

Nevertheless, foreign participants at the conference program amounted to 30% of the 2,500 total, according to Vom Hoevel, who promised a truly international organization in 1977 with both English and French simultaneous translation.

Part of the process of internationalizing Systems will be to widen the panel of sponsors to include bodies in other countries and representatives of international associations as well as of German bodies, he said.

Plans of PTTs Concern Europe

(Continued from Page 43)

service on data transmission line maintenance, she pointed out this would mean trebling a labor force which already accounts for 55% of the PTT's costs and which the government has asked the PTT to cut back despite trade union pressures.

The PTT is making great efforts to improve its own communication and understanding with customers, Wolf said.

"First of all we need clear rules within our own organization as to who is responsible for what," she said.

"We are also embarking upon a program of training for our staff which will continue and hope thereby to offer better advice and consultancy services to our subscribers."

But the PTT requires more feedback from users on what they really need, she said. Her speech was greeted with what seemed to be cynical laughter in places and was followed by a lively question and answer session.

Kreutzer had asked users how well the German post and telecommunications authorities were carrying out their marketing of their services, if they were providing the sort of advice to users and manufacturers and if the level of maintenance service was right.

THIS IS A
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Exhibitors Cautiously Predict German Mart Upswing

By Andrew Lloyd
Special to Computerworld

MUNICH – There is a definite upward trend in the OEM business in West Germany, Europe's largest market, according to the U.S. Trade Center at Systems 75 here.

However, most exhibitors were less specific, and an atmosphere of cautious uncertainty surrounded the first few days of the biennial exhibition and conference here.

Although nearly all the 307 exhibitors anticipated the show would give some indication if and when the economic recovery in Germany would take place, not many expect an upturn in business before next spring.

Data gathered by the U.S. Trade Center here showed at least one sector of the computer business, the OEMs, may be pulling out of the slow growth stage it has experienced in Germany over the last 18 months.

"Evidence of the upward trend has come from the responses of the various sectors, including users, computer manufacturers and the exhibitors. A definite up trend in the computer business is to be expected," a spokesman for the U.S. Trade Center here said.

The German exhibition organizers suggested Digital Equipment Corp. was expecting a 40% growth in the minicomputer sector in West Germany – a figure unconfirmed by personnel on the DEC stand.

The Systems 75 organizers also said U.S. firms had already done $50 million worth of business in the first half of the exhibit, a figure which trade center officials would not confirm.

Apart from the positive declaration of the trade center on the OEM suppliers, most exhibitors were less specific.

However, most appeared to be satisfied with their progress.

Most praised the level of visitor and the quality of inquiry at the exhibition.

There were 307 firms from 12 countries exhibiting, with the first appearance of Nixdorf computer and AEG Telefunken swelling the ranks of exhibitors.

The theme of Systems 75 – "computer meets the end user" – seems to have resulted in the right sort of end-user client visiting the exhibition, and most OEM suppliers were satisfied as well.

CW at Systems 75

U.S. Projections for Mart

The U.S. government projections call for the German DP industry to grow not much more than 6% next year, for sales of more than $1.5 billion.

But these figures exclude minicomputers and terminals.

Although the U.S. has maintained its share of imported equipment in Germany, the overall value of imports had declined in relation to total consumption.

Nevertheless, the U.S. total contribution is significantly higher than the import value of $200 million, since IBM and many others have large manufacturing operations in Germany.

According to official sources, the best sales prospects for U.S. products are in intelligent terminals and certain types of high-performance peripherals such as fast printers, optical character recognition equipment and computer-output microfilm.

The market for the more traditional medium and large systems is beginning to show signs of saturation.

Tesdata Growth In Europe Seen At Varying Rates

By Andrew Lloyd
Special to Computerworld

MUNICH – Although Tesdata Systems Corp. President Tom Stone expects a 100% growth in Europe next year and a 60% to 70% growth worldwide, more modest projections were voiced by H. Vallbrecht, chairman of the Tesdata user group.

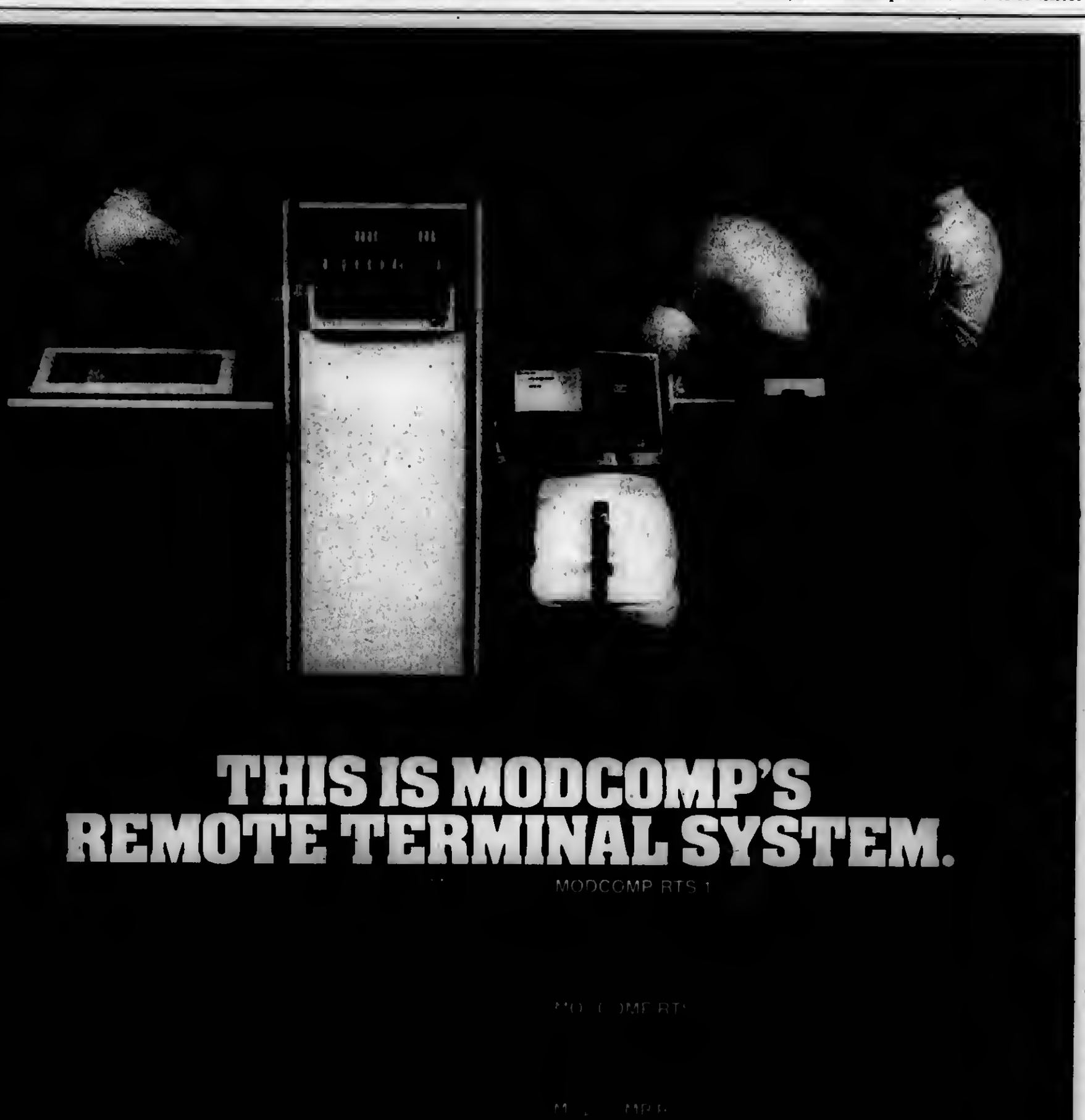
The field of performance measurement is growing slowly, mainly because of the economic situation, Vallbrecht said.

Stone said IBM Japan wants to use Tesdata's new MS series of hardware monitors instead of IBM's SMI for its development work in hardware and software.

Currently the only IBM use of Tesdata equipment has been by IBM user departments, he said. Stone is in Europe for the first European showing of the MS range and for a user group meeting.

Although Vallbrecht indicated he can cite quite a few cases where measurement tools have reduced costs, he said they are more likely to lead to better use of equipment than reduced volume of equipment.

"One large public authority took one of our studies and, after examining the results, sent several peripheral devices back to IBM because the customer realized they were no use at all," he said.



Unidata Future Uncertain

The future of the European DP scene is unknown as observers wait for the pieces to fall in place after several recent developments.

The future of Unidata, the European consortium of three DP firms – Compagnie International pour l'Informatique (CII), Siemens and Philips – is up in the air. CII is merging with Honeywell Bull, which leaves CII's role in Unidata in question, according to foreign press.

Philips is withdrawing from the large and medium-scale systems market, including the Unidata 7.720 project.

Siemens, the third partner, makes two of the Unidata machines and has the capability to make other models as well, press reports indicate.

The French government reportedly is moving toward restructuring its minicomputer area, probably using Thomson CSF as a focal point. The minicomputer activities of CII are not involved in the merger with Honeywell Bull.

Work Force Down

HIS Building Minis in Massachusetts

By Molly Upton
Of the CW Staff

BOSTON – Honeywell Information Systems' (HIS) principal thrust in Massachusetts will be in the minicomputer manufacturing area, Honeywell President Edson W. Spencer told a Rotary Club luncheon here.

HIS is in the computer business for the long haul, he said, and he has "considerable confidence in our ability to grow in this very exciting and very competitive business."

In explaining why the firm has reduced its number of employees in the Boston area to a total of about 6,000 for both the data processing and controls area, he cited technological developments and geographical growth of the company.

HIS employs about 5,000 in the Boston area now, which is nearly 4,000 fewer than two years ago, he said.

The computer industry has moved from a labor-intensive to a capital-intensive, high-technology area, he said, which has been reflected in a dramatic reduction in the size and cost of products.

The merger with General Electric (GE) caused HIS' business to expand geographically with more business outside the U.S.

Although Honeywell has closed plants in Framingham and Lowell, it has its minicomputer manufacturing in Brighton, its engineering in Billerica and peripherals in Lawrence. Field service is based in Newton, he added.

The firm brought production of its 7700 CRT terminals from Oklahoma City to Brighton so the Boston area can produce complete minicomputer systems, he observed.



CW Photo by M. Upton

Edson W. Spencer

Spencer told reporters he did not view this emphasis on minis as a replacement tactic for larger machines, but rather as embodying the "more and better" approach.

Minis definitely have a future in the distributed DP area, as well as in control systems, he said.

He would not comment on whether there will be a new line of minicomputers.

Spencer observed wryly that Honeywell missed its initial computer industry projections by a wide margin.

Its first business plan for the computer industry in 1955 called for 30 machines installed within three years, giving it 10% of the market on a $30 million investment. The venture would be profitable.

However, he noted, it was not until 1970 that the firm's computer business was profitable, after an investment of about $2 billion.

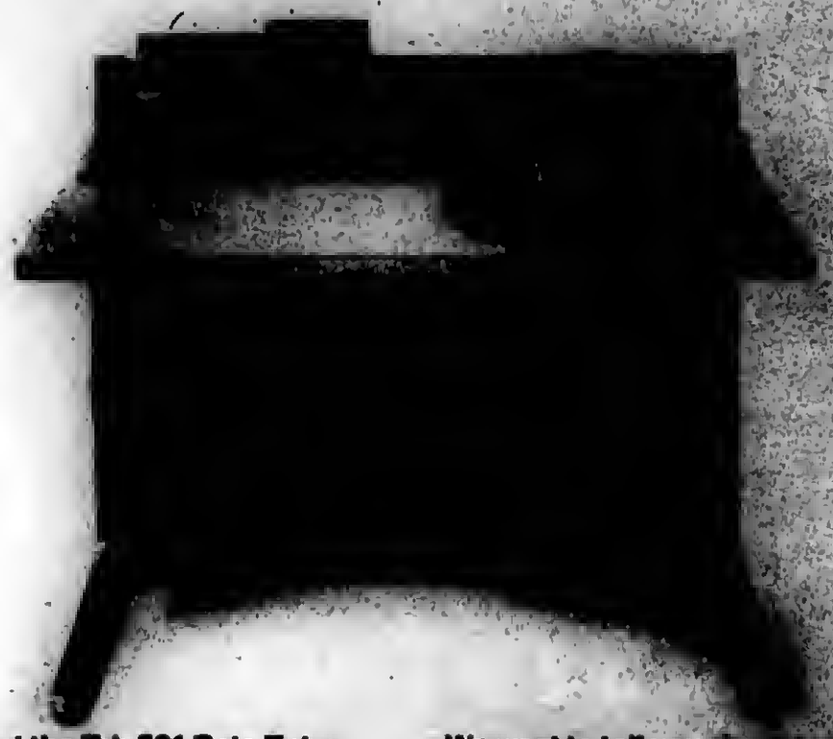
Computer operations have been profitable since 1970, he said, following the merger of GE into the firm.

The firm currently has 17,000 installations, which makes it number two in the industry, he said, with 10% of the world market.

Negotiations for the merger of Honeywell Bull with Compagnie Internationale pour l'Informatique are proceeding, and problems are "on the way to solution. The documents are in the hands of lawyers," he said, and the matter will proceed along the same lines as previously announced.

The letter of intent recently signed with Xerox to assume maintenance and service of its base should be effected by year-end. "This will make a positive contribution to revenues and earnings," he said.

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Data 100 Income, Sales Increase In Three Months

MINNEAPOLIS – Data 100 Corp. reported a 40% increase in earnings on a 35% rise in revenues for the third quarter ended Sept. 30 compared with the year-ago period.

Nine-month earnings were also improved.

For the third quarter, the firm earned $1.8 million or 51 cents a share, including a $780,000 tax credit, compared with earnings of $1.3 million or 43 cents a share in the year-ago period, when there was a $547,000 credit.

Despite the absence of non-recourse sales to third-party leasing companies, revenues for the quarter rose to $24.6 million compared with $18.2 million in the same 1974 period.

President Edward D. Orenstein said the high proportion of long-term leases of terminal equipment, which the company records as sales, continued through the third quarter.

As a result, revenues from recorded sales increased 38% to $38.4 million while rental and service revenues totaled $29.6 million, a 46% increase in the nine months.

During the nine months, Data 100's earnings rose to $4.8 million or $1.35 a share compared with $3.2 million or $1.06 a share a year ago. Tex credits for the 1975 period were $2 million compared with $1.3 million for the 1974 period.

Orenstein said business in Europe during the quarter continued strong and the company's domestic business has now begun to show signs of improvement.

New order rates, though lower than for the same period last year, have picked up noticeably from levels during the first two quarters.

Partly due to increasing sales to OEMs, total shipments of all equipment were up at the end of the nine months, he said.

Sycor Net Rises In Nine Months

ANN ARBOR, Mich. – Sycor, Inc.'s earnings for the third quarter and nine months rose while revenues increased 48% and 34%, respectively.

Revenues for the third quarter ended Sept. 28 increased to $15.3 million from the $10.3 million in the year-ago period.

Seles were up 44% to $9.7 million; rental end service income rose 56% to $5.6 million from the same 1974 period.

Eernings totaled $1.9 million or 65 cents a share, including a $330,500 credit, compared wlth $1.5 million or 54 cents a share in the year-ago quarter when there was a $585,000 credit.

Revenues for the nine months were $39.6 million compared with $29.5 million achieved in the comparable perlod a year ago.

Earnings totaled elmost $4.5 million or $1.57 a share, compared with $3.7 million or $1.33 a share for the year-ago period.

Credits during the 1975 period totaled $997,000 compared wlth nearly $1.5 million in the same 1974 period.

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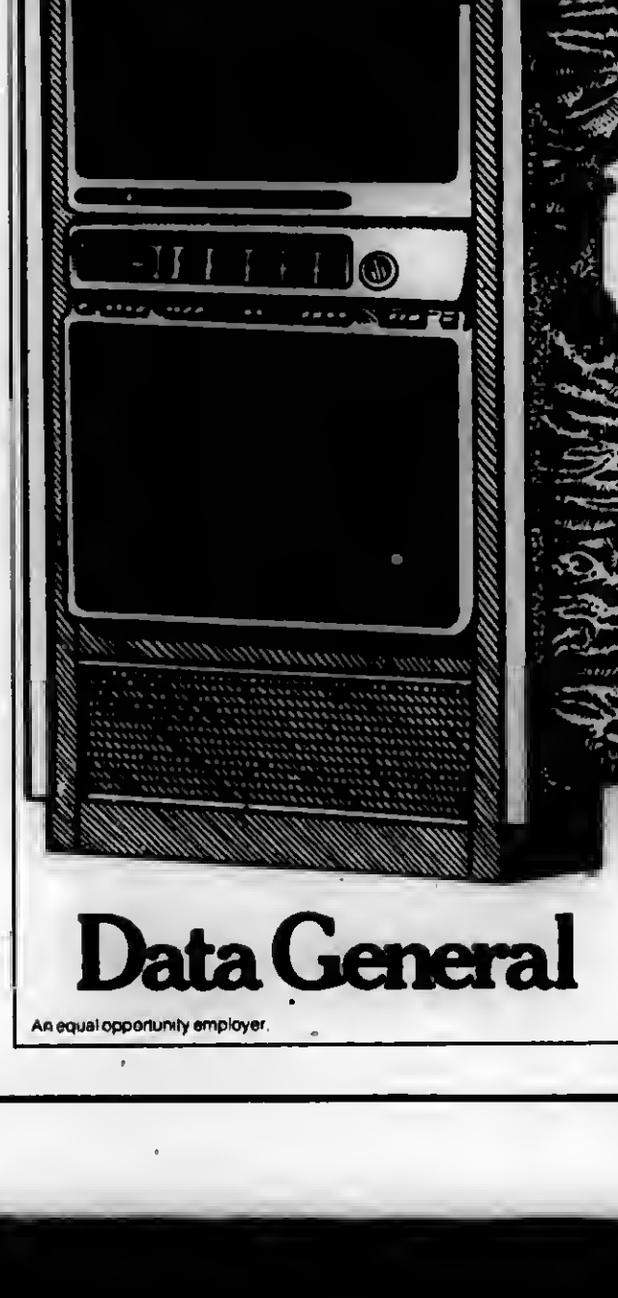
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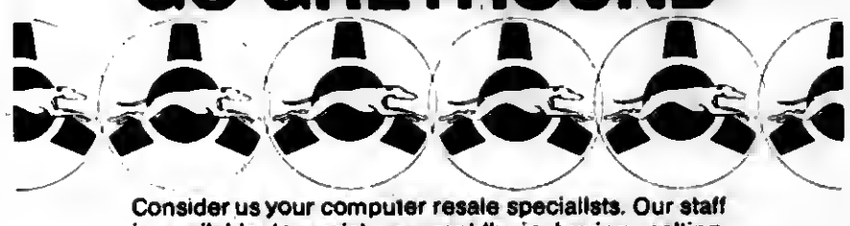
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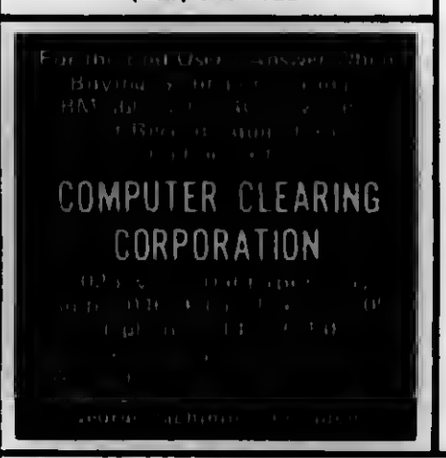
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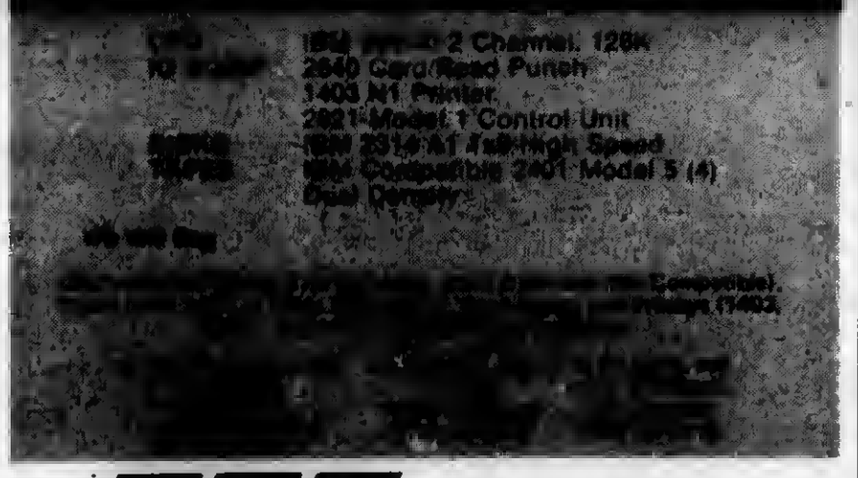
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For Quarter, Half-Year

Telex Earnings Show Strong Gain

TULSA, Okla. – Continuing its thrust toward sales rather than leasing of equipment, Telex Corp. showed sizable improvements in earnings for the quarter and six months ended Sept. 30 despite revenue declines.

For the quarter, the firm earned $1.7 million or 15 cents a share, including a $609 tax credit, compared with $221,000 or 2 cents a share in the same period a year ago.

Revenues dropped to $24.9 million compared with nearly $27.4 million in the year-ago period.

During the six months, Telex earned $3.6 million or 34 cents a share, including a $1.2 million tax credit, compared with the year-ago figure of $386,000 or 4 cents a share.

Revenues also declined, to $52.4 million in the half-year compared with $56.9 million in the same 1974 perlod.

The Computer Products Group reported a profit of $850,000 for the second quarter and $2.7 million for the six months. These figures reflect management efforts to cut costs and the emphasis on sales of equipment, according to S.J. Jatras, Telex president.

The Communications Group contributed $825,000 in the quarter and $984,000 for the six months.

The value of the backlog is down, with firm orders for sales or lease of equipment having a sales value of $14.3 million compared with $20.8 million Sept. 30 last year.

DEC Results Up In First Quarter

MAYNARD, Mass. – Digital Equipment Corp.'s first-quarter revenues and earnings increased over the year-ago period.

Earnings rose to $11.4 million or 95 cents a share compared with $7.5 million or 63 cents a share in the same period last year.

Revenues rose 26% to $140.5 million compared with $111.8 million in the year-ago period.

Service and other revenues rose 56% to $29.7 million; equipment sales for the recent quarter were $110.7 million.

Orders for minicomputers and peripheral products were noticeably stronger in the first quarter, the firm said. This customer demand was particularly strong in thc business products and education markets. An improving trend was also noted in the OEM market.

Demand in the industrial sector of business, however, is still lagging due to restraint in capital investment, DEC said. Additionally, orders for the company's new line of microcomputers and terminals have continued to increase as unit production approached volume levels.

Orders for DEC's large system, the Decsystem-10, met expectation for the quarter, reflecting favorable competitive changes in the large systems marketplace and an emerging trend in renewed customer spending in certain of the market segments, according to the company.

A similar pattern in order and shipment trends was evident overseas, DEC said.

DG Sets Records For Fiscal 1975

SOUTHBORO, Mass. – Data General Corp. (DG) finished the year with record sales and earnings.

Earnings for the year ended Sept. 27 rose to nearly $12.9 million or $1.51 a share compared with $9.9 million or $1.22 a share in 1974.

Revenues rose to $108.2 million compared with $83.2 million last year.

During the fourth quarter, earnings rose to almost $4.3 million compared with $3.6 million in the year-ago period. Revenues totaled $34.6 million compared with $32.1 million in the same 1974 quarter.

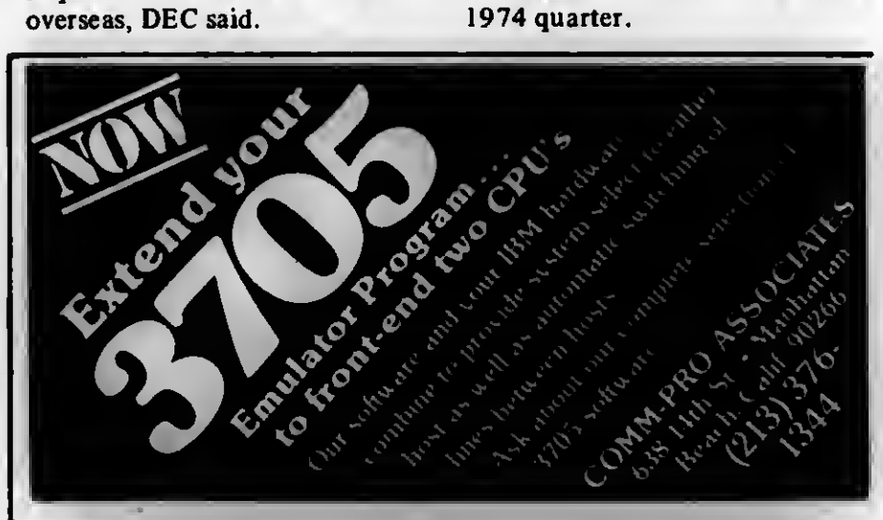
OSC Suffers '75 Loss

NEWTOWN, Pa. – Optical Scanning Corp.'s (OSC) 1975 results dropped to a loss of $891,911 or $1.36 a share compared with earnings of $598,012 or 91 cents a share, including extraordinary credits of $376,594, for the same period last year.

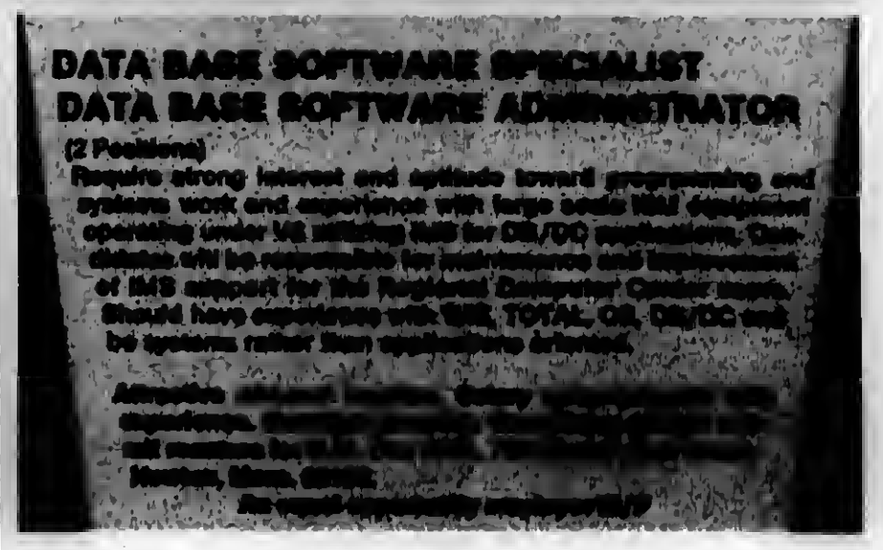
Revenues declined to $16.7 million compared with $19.2 million for the preceding year.

Thc company has repurchased about $1.8 million of its outstanding 8% subordinated convertible debentures from one debenture holder for $497,750 plus accrued interest.

The gain on this transaction net of income tax effect and unamortized debt discount will be reflectcd as an extraordinary item in 1976 financial statements.







Earnings Reports

SCI SYSTEMS
Year Ended June 30

	1975	1974
Shr Ernd	$.97	$.40
Revenue	25,054,462	23,780,540
Spec Cred	222,400	49,000
Earnings	710,098	265,780

ENNIS BUSINESS FORMS
Three Months Ended Aug. 31

	1975	1974
Shr Ernd	$.27	$.50
Revenue	13,931,717	14,834,809
6 Mo Shr	.49	.83
Revenue	27,333,185	29,947,988
Earnings	1,134,549	1,945,267

BASF AG
aSix Months Endad June 30

	1975 (000)	1974 (000)
Revenue	$1,590,000	$1,930,000
Earnings	82,000	157,500

a-Results computed at mark's current rate.

CALIFORNIA COMPUTER PRODUCTS
Three Months Ended Sept. 28

	1975	1974
Shr Ernd	.....	$.25
Revenue	$26,655,000	32,873,000
Earnings	(3,224,000)	781,000

DATAPRODUCTS
Three Months Ended Sept. 27

	1975	a1974
Shr Ernd	$.21	$.20
Revenue	20,209,000	21,079,000
Earnings	1,401,000	1,371,000
6 Mo Shr	.46	.41
Revenue	38,902,000	42,581,000
Earnings	b3,132,000	2,786,000

a-Restated to treat Data Card Corp. as unconsolidated subsidiary. b-Includes gain of $739,000 from sale of Data Card Corp. interests.

INTEL
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.63	$.53
Revenue	34,669,000	34,463,000
Earnings	4,370,000	3,475,000
9 Mo Shr	1.69	2.52
Revenue	96,535,000	103,172,000
Earnings	11,675,000	16,779,000

MEASUREX
Three Months Ended Aug. 31

	1975	e1974
Shr Ernd	$.17	$.32
Revenue	14,095,000	10,668,000
9 Mo Shr	.89	1.00
Revenue	41,141,000	28,899,000
Earnings	2,892,000	2,984,000

e-Restated.

DATA GENERAL
Year Ended Sept. 27

	1975	1974
Shr Ernd	$1.51	$1.22
Revenue	108,222,000	83,196,000
Earnings	12,851,000	9,895,000

DOCUTEL
Three Months Ended Sept. 30

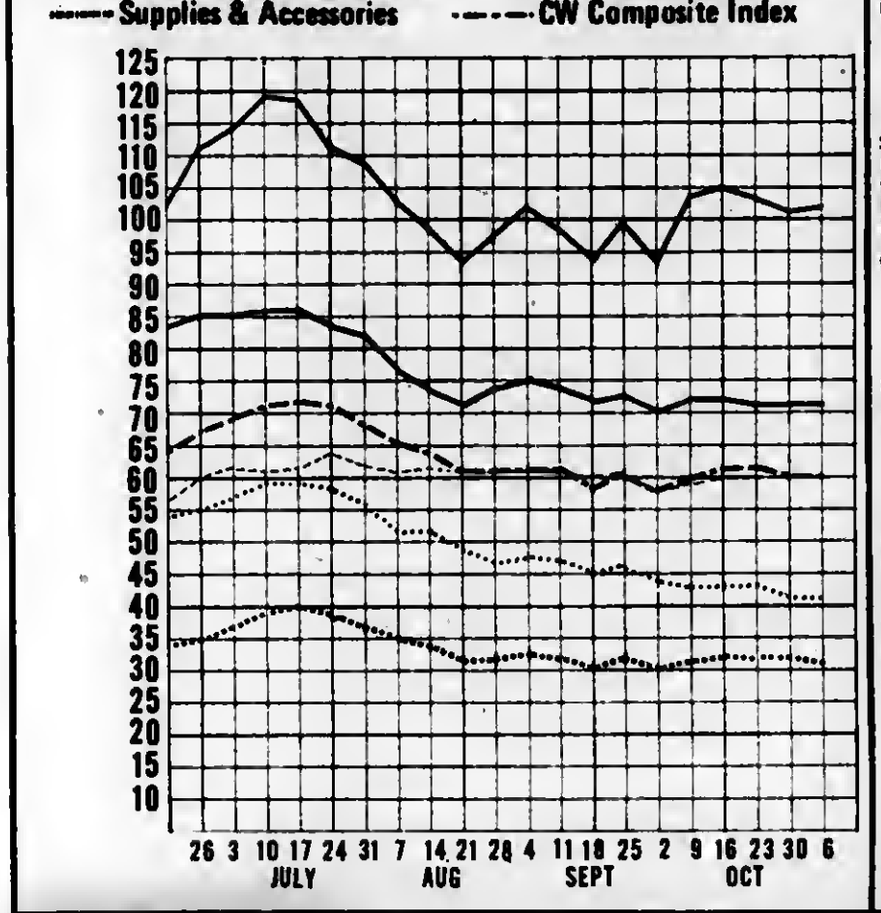
	1975	1974
Shr Ernd	$.17	$.10
Revenue	7,362,000	7,159,000
Tax Cred	194,000	.....
Earnings	432,000	248,000
9 Mo Shr	.25	.....
Revenue	19,627,000	18,889,000
Tax Cred	288,000	.....
Earnings	640,000	(935,000)

COMSHARE
Three Months Ended Sept. 30

	1975	e1974
Shr Ernd	$.22	$.37
Revenue	3,449,664	2,902,514
Tax Cred	148,000	240,000
Earnings	301,800	501,000

e-Restated for accounting change.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, NOVEMBER 5, 1975

All statistics compiled, computed end formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

F X C H		1975 RANGE (1)	CLOSE NOV 5 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	83	-2 3/8	-2.7
O	COMPUTER AUTOMATION	2- 10	10	+ 3/4	+8.1
N	CONTROL DATA CORP	11- 23	19 3/4	+1 1/2	+8.2
N	DATA GENERAL CORP	10- 38	35 1/8	- 3/4	-2.0
C	DATAPOINT CORP	6- 26	24 1/4	+1 3/4	+7.7
O	DIGITAL COMP CONTROL	1- 4	2 1/2	- 1/4	-9.0
N	DIGITAL EQUIPMENT	46-135	128 3/4	+ 1/2	+0.3
N	ELECTRONIC ASSOC.	2- 3	2 3/8	+ 1/4	+11.7
A	ELECTRONIC ENGINEER.	5- 10	8 5/8	- 1/8	-1.4
N	EXXORC	23- 42	27 5/8	+ 1/8	+0.4
O	GENERAL AUTOMATION	4- 14	5 1/4	0	0.0
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	58-120	100 1/2	-1 1/4	-1.2
N	HONEYWELL INC	22- 40	34	+ 3/8	+1.1
N	IBM	159-224	215 3/4	+4 3/4	+2.2
O	MEMOREX	1- 10	8 5/8	+ 1/2	+6.1
O	MICRODATA CORP	2- 6	6 1/8	+ 3/8	+6.5
O	MODULAR COMPUTER SYS	5- 19	9 1/2	+ 1/4	+2.7
N	NCR	15- 39	24 3/4	+ 3/4	+3.1
O	PRIME COMPUTER INC	2- 6	4 3/4	0	0.0
N	PERKIN-ELMER	16- 30	25 3/8	- 1/2	-1.9
N	RAYTHEON CO	26- 59	48 3/4	-4 1/8	-7.8
N	SINGER COMPANY	9- 17	10 1/8	+ 5/8	+6.5
N	SPERRY RAND	26- 49	43 7/8	+1	+2.3
A	SYSTEMS ENG. LABS	1- 5	3	+ 1/8	+4.3
N	VARIAN ASSOCIATES	7- 18	14	0	0.0
N	WANG LABS.	7- 17	11 1/8	+ 1/4	+2.2
N	XEROX CORP	51- 86	55 7/8	-1	-1.7
	LEASING COMPANIES				
C	COMDISCO INC	1- 5	2 5/8	0	0.0
A	COMMERCE GROUP CORP	2- 4	2 1/2	- 1/8	-4.7
A	COMPUTER INVSTRS GRP	1- 2	5/8	0	0.0
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	OCL INC	0- 1	3/8	0	0.0
N	ORF INC	3- 6	4 3/8	- 1/4	-5.4
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/8	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 1/2	0	0.0
N	ITEL	3- 9	6 1/2	+ 1/8	+1.9
N	LEASCO CORP	4- 8	6 1/2	- 1/8	-1.8
O	LEASPAC CORP	1- 1	1/8	0	0.0
C	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NPC INC	0- 4	5/8	+ 1/8	+25.0
A	PIONEER TEX CORP	2- 7	5 1/2	- 3/8	-6.3
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	7 3/4	- 3/8	-4.6

E X C H		1975 RANGE (1)	CLOSE NOV 5 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	1	- 1/8	-11.1
A	APPLIED DATA RES.	1- 10	1 1/2	0	0.0
N	AUTOMATIC DATA PROC	29- 65	56	-1	-1.7
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COMPUTER DIMENSIONS	2- 6	3	0	0.0
O	COMP ELECTION SYSTMS	3- 7	7	+ 3/4	+12.0
O	COMPUTER HORIZONS	1- 1	3/4	0	0.0
O	COMPUTER NETWORK	1- 3	3 1/8	0	0.0
N	COMPUTER SCIENCES	2- 6	4 5/8	+ 1/8	+2.7
O	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
O	COMPUTER USAGE	2- 4	2 1/8	0	0.0
O	COMSHARE	3- 4	2 3/4	+ 1/8	+4.7
O	DATATAB	1- 2	7/8	- 1/8	-12.5
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	12	-3 1/4	-21.3
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
O	KEANE ASSOCIATES	2- 3	2 1/2	+ 1/4	+11.1
O	KEYDATA CORP	2- 3	1 7/8	- 1/8	-6.2
O	LOGICON	3- 5	3 1/2	0	0.0
A	MANAGEMENT DATA	1- 3	1 3/4	0	0.0
A	NATIONAL CSS INC	6- 14	10 3/8	- 1/2	-4.5
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	13 7/8	+1	+7.7
N	PLANNING RESEARCH	2- 6	3 3/4	+ 3/8	+11.1
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	2 7/8	- 1/8	-4.1
O	REYNOLDS & REYNOLD	10- 24	15 1/2	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/8	0	0.0
O	TYMSHARE INC	7- 21	19 7/8	+ 1/4	+1.2
A	UPS SYSTEMS	2- 4	3 1/2	+ 1/4	+7.6
N	WYLY CORP	2- 4	3 1/8	+ 1/8	+4.1
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	7 3/4	- 3/8	-4.6
O	ADVANCED MEMORY SYS	1- 7	5 1/8	- 1/2	-8.8
N	ANDEX CORP	3- 7	5 1/8	- 1/2	-8.8
O	ANDERSON JACOBSON	1- 3	2 1/8	+ 1/8	+6.2
O	BEEHIVE MEDICAL ELEC	1- 5	3 1/8	- 1/8	-3.8
A	BOLT,BERANEK & NEW	5- 13	6 7/8	+ 3/8	+5.7
N	BUNKER-RAMO	4- 9	4 1/8	- 1/2	-10.8
A	CALCOMP	4- 7	3 1/2	- 1/8	-3.4
O	CAMBRIDGE MEMORIES	2- 5	2 1/4	- 1/8	-5.2
N	CENTRONICS DATA COMP	7- 25	18 1/4	- 1/8	-0.6
O	CODEX CORP	15- 38	34	- 3/4	-2.1
O	COGNITRONICS	1- 2	7/8	0	0.0
O	COMPUTER COMMUN.	1- 2	7/8	+ 1/8	+16.6
O	COMPUTER CONSOLES	3- 7	3 1/4	-1	-23.5
A	COMPUTER EQUIPMENT	1- 3	1 5/8	- 1/8	-7.1
O	COMPUTER MACHINERY	1- 2	7/8	- 1/8	-12.5
O	COMPUTER TRANSCEIVER	1- 2	1	0	0.0
O	COMTEN	2- 5	3 5/8	+ 1/8	+3.5
N	CONPAC CORP	12- 27	26 3/4	+2 1/8	+8.6
O	DATA ACCESS SYSTEMS	1- 3	1 1/4	0	0.0

E X C H		1975 RANGE (1)	CLOSE NOV 5 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA 100	5- 16	9 3/8	- 3/8	-3.8
A	DATA PRODUCTS CORP	7- 6	4 3/8	+ 3/8	+9.3
O	DATA TECHNOLOGY	1- 3	1 3/8	0	0.0
O	DATUM INC	1- 2	7/8	0	0.0
O	DECISION DATA COMPUT	3- 7	3 1/4	- 1/8	-3.7
O	DELTA DATA SYSTEMS	1- 1	1/8	- 1/8	-50.0
O	DIZAN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	1 3/8	0	0.0
O	FARRI-TEK	1- 1	3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1 1/4	0	0.0
N	HAZELTINE CORP	3- 6	3 1/2	- 1/8	-3.4
N	HARRIS CORP	18- 31	30 3/4	+ 5/8	+2.0
A	INCOTERM CORP	3- 12	9 7/8	+ 1/4	+2.5
O	INFOREX INC	2- 5	2 1/2	- 1/8	-4.7
O	INFORMATION INTL INC	8- 14	12 1/2	- 1/4	-1.9
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	MILGO ELECTRONICS	8- 24	15 1/4	0	0.0
N	MOHAWK DATA SCI	1- 5	3 1/8	0	0.0
O	OPTICAL SCANNING	1- 3	2 5/8	0	0.0
O	PENRIL CORP	2- 2	1 1/4	0	0.0
O	PERTEC CORP	2- 8	4	- 3/4	-15.7
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1/4	0	0.0
O	QUANTOR CORP	2- 4	3 1/2	+ 1/8	+3.7
O	RECOGNITION EQUIP	2- 9	6 3/8	+ 1/4	+4.0
N	SANDERS ASSOCIATES	3- 11	8 1/2	+ 3/8	+4.6
O	SCAN DATA	1- 3	1 1/4	- 1/4	-16.6
O	STORAGE TECHNOLOGY	6- 17	12	- 1/8	-1.0
O	SYCOR INC	5- 17	17 1/4	+1 1/4	+7.8
O	T PAR INC	3- 6	6 1/4	+ 1/4	+4.1
O	TALLY CORP.	1- 5	3	0	0.0
O	TEC INC	1- 4	2 3/4	0	0.0
N	TEKTRONIX INC	18- 43	41 3/8	- 1/8	-0.3
N	TELEX	1- 3	2 1/8	+ 1/8	+6.2
O	WANGCO INC	4- 9	6 7/8	- 1/8	-1.7
O	WILTEK INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 1/2	0	0.0
A	BARRY WRIGHT	5- 7	5 1/2	0	0.0
O	CYBERNATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	31 1/2	+ 1/2	+1.6
O	DUPLEX PRODUCTS INC	12- 25	15 3/8	- 3/8	-2.3
N	ENNIS BUS. FORMS	5- 7	5 1/8	+ 3/8	+7.8
O	GRAHAM MAGNETICS	5- 13	8 1/4	0	0.0
O	GRAPHIC CONTROLS	8- 21	12 1/2	- 1/4	-1.9
N	3M COMPANY	43- 69	57 1/4	+ 1/8	+0.2
O	MOORE CORP LTD	39- 51	45 1/4	+ 3/4	+1.6
N	NASHUA CORP	9- 22	11	+ 1/4	+2.3
O	STANDARD REGISTER	11- 20	15 1/2	- 1/4	-1.5
O	TAB PRODUCTS CO	4- 8	8	0	0.0
N	UARCO	17- 24	19 3/4	+1 1/4	+6.7
O	VANIER GRAPHICS CORP	4- 7	4 1/4	- 1/4	-5.5
A	WABASH MAGNETICS	3- 5	4	0	0.0
N	WALLACE BUS FORMS	15- 25	16 1/4	+ 1/4	+1.5

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NEWSPAPER

NEWS IN BRIEF

Decsystem-20 Coming With Virtual OS, T/S?

By Don Leavitt
Of the CW Staff

MAYNARD, Mass. – Digital Equipment Corp. has apparently completed the specifications of a "high-performance, virtual memory system" called the Decsystem-20.

Although company spokesman had no comment, internal documentation dated October 1975 claimed the hardware "provides a multitasking, multiprogramming environment to support concurrent time-sharing, batch and transaction processing."

DEC has integrated the central processor, memory and I/O controllers in its design of the Decsystem-20, which covers only 28 sq ft of floor space. Internally, the processor is built of "high-density, multilayer circuit boards and emitter-coupled logic (ECL) circuitry," according to the "company confidential" marketing guide.

The Decsystem-20 memory system consists of from 64K to 256K 37-bit words. Memory cycle time is 1.28 μsec for a single access, but user-controlled features can enhance this rate, providing a mem-

(Continued on Page 5)

IBM Ready to Collect Cancellation Penalties

ARMONK, N.Y. IBM users who hroke long-term leases for peripherals in the last two years will receive invoices charging penalty payments from the company by the end of this month.

IBM was barred from collecting cancellation penalties on early termination of extended-term and fixed-term contracts hy Judge A. Sherman Christensen in September 1973 as a result of the original Telex antitrust action.

"IBM's fixed-term plan was generated and implemented at the time it was with the primary intent and purpose of suppressing plug-compatible competition and to maintain its monopoly power," Christensen said in his decision against IBM [CW, Sept. 26, 1973].

When the Tenth Circuit Court of Appeals overturned the lower court's decision, IBM promised "swift action" in collecting the penalty payments on long-term lease cancellations [CW, Feh. 12].

The penalties were reinstated on Oct. 20, shortly after Telex announced it would not appeal to the Supreme Court. They will be collected retroactively to the time they were suspended.

IBM declined comment on how many users will be affected.

Wants Legislative Safeguards

Levi Shelves FBI Message-Switching Plan

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The Federal Bureau of Investigation (FBI) has been denied permission to proceed with its computerized message-switching system until legislation is passed to regulate the exchange of computerized criminal history information.

U.S. Attorney General Edward H. Levi tabled the communications plan last week, bringing to an end a six-month dispute between the FBI and members of Congress who saw the FBI-controlled system as leading to a "national police force" [CW, Oct. 30, 1974].

The proposed network would have enhanced the FBI's National Crime Information Center's Computerized Criminal History (NCIC/CCH) system by switching any state request for a computerized criminal record from an NCIC/CCH index to the state where the particular record resides.

Every state request for information – including administrative messages – would go through the FBI system.

Under the plan, records of multistate offenders would have heen stored in Washington computers. Single-state offender records would have been maintained in their respective states as soon as they had the technical capability of doing so.

Until that time, however, the proposal called for the FBI to maintain even single-state offender records here.

Widespread Criticism

Capitol Hill was not the only source of criticism for the plan.

The White House Office of Telecommunications Policy, the Domestic Council Committee on the Right of Privacy and the Law Enforcement Assistance Administration objected to the plan in meetings and official memoranda [July 23].

State governors and attorneys general also challenged the plan on grounds the system would give the FBI ahility to monitor the operations of state law enforcement agencies and otherwise intrude in state matters – a role they considered improper for a federal law enforcement organization.

Although a report on the matter was sent to the White House about 10 days ago, and President Ford saw the report, no one would comment on what position he took in the controversy.

Sources noted, however, that whatever information he gave the Attorney General helped Levi come to a final decision since Levi's announcement followed so quickly after the President saw the plan.

"Levi had all the information needed to make the decision some months ago, but he didn't act. The only new information

(Continued on Page 4)

Performance Upgrades Featured On Cardless IBM 370/115, 125

By Ronald A. Frank
Of the CW Staff

WHITE PLAINS, N.Y. – IBM has introduced performance upgrades for the 370/115 and 370/125 following the lead set earlier by its World Trade division [CW, Nov. 5].

Both systems now come in cardless configurations relying on the 3540 diskette for I/O and can have increased on-line disk storage. The 115 can have up to eight 3340 disk drives while the 125 can have up to 16 3340 drives.

The two 370 systems now operate with string switching, which allows a disk subsystem to be shared by two CPUs and allows the smaller 370s to back up a larger 370 mainframe, IBM said.

The 115 has an additional satellite processor within the mainframe that improves the internal instruction execution rate between 55% and 75%, the company said.

In the 125, the control storage cycle time has been improved from 480 nsec to 320 nsec. This improves the 125 instruction execution rate between 20% and 30%, according to IBM.

The 115 has a faster multiplexer channel which can operate at 25K byte/sec in byte mode. This is described as one-third faster than the earlier model.

In addition, main memory has been increased to 256K, an increase of one-third.

All features can be installed in systems in the field, with first shipments scheduled for second quarter of 1976 on the

(Continued on Page 4)

Honeywell Sets First Loyalties To Users With Upkeep Contracts

By Nancy French
Of the CW Staff

WALTHAM, Mass. – Users who want Honeywell maintenance and no-hassle parts availability should be prepared to sign a maintenance contract or pay a premium for what they do get, according to Richard R. Douglas, vice-president of DP operations for Honeywell Information Systems.

For a variety of business reasons, Honeywell has decided to emphasize service to contract customers and has "set field service plans and staffing levels to meet their needs," he explained.

Time and materials customers get what's left over. "They create an added workload for our field staff," he explained, "so to assure service to these unscheduled users does not impact on service levels for our contract customers, and also to absorh the cost of this service, we have set a noncontract rate of $95/hour with a four-hour minimum."

Douglas spelled out this policy in an interview here recently in answer to objections some noncontract users have expressed about changes in the mainframer's maintenance policies [CW, Aug. 6].

Douglas also explained the company's reasons for giving up precertification of systems – even those that have heen under its maintenance – when that equipment is sold to another user.

"While it is true that Honeywell has given up precertification, we will inspect that system and give the seller a letter of condition," Douglas said.

The statement the seller receives at the time of sale will include such information as the software release under which the system is running, a list of the exact configuration and types of equipment by name and serial number and the fact that the system has been under Honeywell

(Continued on Page 4)

EFTS Unit Chided for DP Lack

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. The National Commission on Electronic Funds Transfer has become a reality, but not without sharp complaints from at least one industry group.

The Association of Data Processing Service Organizations (Adapso) has issued a position paper criticizing the makeup of the commission, because it fails to include anyone "with special experience and qualification in the computer industry" as required, implicitly at least, in the enabling legislation.

Not a single member of the commission is now employed by a computer manufacturer or service company, the association noted and "this absence at the policy level would seriously affect the direction of the commission's study."

The commission was mandated to study electronic funds transfer systems (EFTS) by an act of Congress ahout a year ago. Various government officials are automatically on the study group. but President Ford delayed naming its chairman and industry and "public" members until very recently [CW, Oct. 15].

On Oct. 29, the Senate confirmed retired U.S. Congressman William B. Widnall as chairman of the commission. He took the oath of office early this month.

Adapso continued its hlast by urging Congress to "condition" any extension of interim and final reporting dates "upon the appointment by the President of an individual to the commission who can bring a broad experience

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In U.S. vs. IBM Antitrust Trial

NCR Balks at Giving IBM Five-Year Plan

By Edith Holmes
Of the CW Staff

NEW YORK – It was one of the more dramatic moments in U.S. vs. IBM thus far.

"Mr. Hangen, I believe that you have in your hand the current five-year plan for NCR, is that correct? . . . May I ask that I be given an opportunity to take a look at it?" David Boies, an attorney for IBM, asked John J. Hangen, senior vice-president in charge of corporate affairs for NCR Corp., during the executive's cross-examination here recently.

"I refuse to provide it to you. This is highly confidential information based on NCR's plans and strategies for the next five years, and we consider it as being something that is very company confidential," Hangen replied.

And, in response to questions from Judge David N. Edelstein, he added, "I want to be sure that it is not made available to anybody that could use it to the detriment of NCR, Your Honor."

"Does that include the defendant in this case?" the court asked.

"If the defendant is IBM, I certainly would include the defendant," Hangen stated.

Just the Beginning

This brief, open-court tussle over NCR's product plans and strategies for the next five years proved to be but the beginning of a more extensive battle between IBM and NCR over the last two weeks for further document production by one of the third parties in the case.

Noting that both Hangen and NCR had failed to comply fully with several subpoenas, one as late as Oct. 17, for documents from its files and that some of the material requested in a subpoena served on Hangen in May 1974 has since been destroyed, IBM counsel issued a memorandum to Edelstein on Oct. 23 asking Hangen's cross-examination be deferred until he and his company produce the requested documents.

In an answering memo to the judge, NCR counsel claimed IBM had had ample opportunity – "more than a year" – to acquire this material. Referring specifically to the Oct. 17 subpoena, attorneys for Hangen and NCR said "to seek this type of discovery during the cross-examination of a witness turns the subpoena process into a device for oppression and harassment. NCR is outraged at this behavior by IBM and believes the court should be also."

IBM Motion Granted

But, when Hangen reappeared in court to take the stand on Nov. 3, Edelstein informed the witness and his counsel he had decided to grant IBM's motion. Hangen was then dismissed and given 10 days in which to complete production of the documents requested by the defense.

In his written opinion filed on Nov. 6, the judge indicated he had been persuaded by IBM's argument that there exist a number of NCR documents necessary to an adequate cross-examination of Hangen which had never been produced, despite earlier subpoenas.

"These earlier subpoenas, IBM points out, have never been challenged by NCR or Mr. Hangen," Edelstein noted in his opinion. He added that the Oct. 17 subpoena related specifically to Hangen's direct testimony and to two documents entered into evidence by government attorneys, but neither NCR nor Hangen had attempted to dispute these subpoenas.

The court also commented on IBM's argument that there were several deficiencies in NCR's and Hangen's responses to the Oct. 17 subpoena.

"With respect to documents authored by Mr. Hangen, defendant indicates that although Mr. Hangen has been a high-level officer of NCR for a number of years, IBM has thus far received in response to its various requests only three letters or memoranda authored by him," the judge said.

"IBM avers that counsel for NCR has consistently assured defendant that the reason for the small response was that Mr. Hangen did not maintain any files," Edelstein continued. "Based upon the testimony during Mr. Hangen's cross-examination that he did indeed maintain files of those documents which he originated, IBM asks this court to infer that, given Mr. Hangen's extensive responsibilities with regard to NCR's electronic data processing business, NCR and Mr. Hangen have failed to comply with the subpoenas served upon them."

The judge said that without trying to examine each of IBM's similar charges of deficiencies, he also noted NCR's answering memorandum stated there were documents sought by the IBM subpoenas that have not been produced.

"Thus, when NCR argues in its memorandum in opposition to this motion that it has made 'substantial' compliance with the subpoenas, it becomes quite clear NCR has not fully complied," Edelstein added.

Taken together, NCR's additional arguments that "IBM has had knowledge for over a year of the existence of most of the documents sought in the Oct. 17 subpoena," that Hangen has recently discovered files containing documents which may be responsive to earlier subpoenas and that allegedly confidential documents should not be produced without adequate safeguards to prevent disclosure of the information to NCR's competitors – led the judge to conclude the witness and the corporation had not produced the material they should have.

By the filing of the judge's opinion, the government had written no papers on behalf of its witness and his corporation. In several robing room conversations between the parties and the judge, however, attorneys with the Department of Justice did note they had not been informed of the Oct. 17 subpoena until Monday, Oct. 20 – when the documents requested were to be produced.

NCR did permit one government and one IBM attorney to review the plan following Hangen's refusal to let Boies see the document in court. "From that review, it is apparent both that the plan does contain a great deal of information that NCR considers to be highly confidential and a significant amount of information which is quite relevant to the cross-examination," Boies told the court.

The parties have been working with NCR to devise a means of using only the relevant, nonconfidential portions of the document without exposing the entire five-year plan. Whether an agreement has been or will be reached will only be certain when Hangen again takes the stand and is questioned about this document. When that will be is as yet unclear.

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NBS Finds Privacy Conversion Costs Less Than Expected

By Nancy French
of the CW Staff

WASHINGTON, D.C. – "The cost of retrofitting computer systems to meet privacy requirements will not be as great as has generally been expected," Dr. Ruth Davis, director of the National Bureau of Standards' (NBS) Institute for Computer Sciences and Technology, told the Privacy Protection Study Commission here recently.

Davis based her remarks on the results of a computerized privacy cost model, developed under NBS direction, to determine the technological costs to federal agencies of meeting the requirements of the Privacy Act of 1974.

The cost estimates Davis cited were based on data collected from several agencies and compiled to depict a hypothetical composite "Agency X."

Agency X was assumed to operate an on-line system processing a data base of 7.5 million records. Record length was 500 characters, and records were considered valid for five years.

Personnel costs were as follows: administrative, auditing and programming: $20/hour; clerical and guard duty: $6/hour; batch processing on the computer: $360/hour.

Since the model did not specifically address recordkeeping costs per se, representative costs could not be broken out for all recordkeeping activities.

The privacy conversion cost involved in collecting data directly from the subject was estimated at $111,000.

The provision of the law requiring that all information be collected directly from the data subject whenever practical calls for considerable revision of data collection forms, Davis said.

The cost of labor to redesign the forms and replace the existing forms inventory resulted in a privacy conversion cost of $111,000 for Agency X, according to the model.

Agency X results were based on the assumption that 25 distinct data collection forms were in use and that an average of 150 hours of administrative time were required to redesign a form. It further assumed the average inventory for each form was 150,000 copies and the forms cost .015 cents each.

For Agency X, no additional annual operating cost was found, indicating the method of operation was basically unchanged and old forms cost about the same as new ones, she said.

Data Input Costs

The general question of data input is a broad one, including input validation, and periodic edit checking, audits of systems compliance and protection of data, Davis noted.

Maintaining records accurate and complete enough to comply with the law cost Agency X an annual sum of $480,000, with one time-conversion costs judged at about $20,000.

As for systems assurance, Agency X would have to budget an additional annual outlay of $29,000, with conversion also estimated at about $20,000.

Physical security cost even more, with initial conversion estimated at $124,000, and an added annual expense at $78,000.

These figures were based on the assumptions that the agency used 25 programs which access the data base and that 10 hours were required to implement each check.

Clerical verification of 150,000 records was possible, although the rate of expiring records both reduced this to 75,000 verifications and introduced a need for purging, Davis said. Clerical verification of a record was set at one hour.

To assure reasonable accuracy and completeness of records, systems must be audited to determine that processing is being performed in compliance with specifications, she explained.

Developing audit software and tests, operation of audits and analyzing their results costs Agency X $29,000 annually, with $20,000 needed for initial conversion, the model showed.

About 900 hours of programming time and 100 hours of auditing time would be needed to develop the auditing software, she said.

About 100 hours of computer processing time and 1,200 hours of labor would be required for auditing annually, she added. Software maintenance was included in the total annual cost, she noted.

700 Federal Systems Handle Personal Data

WASHINGTON, D.C. – Current estimates indicate 700 computer systems are used in the Federal government to process personal information, according to Dr. Ruth Davis, director of the National Bureau of Standards' Institute for Computer Sciences and Technology.

The figure was based on the General Services Administration (GSA) inventory of general-purpose computer systems, published accounts of systems of records reported in the *Federal Register* by agencies of the Federal government as required by the Privacy Act and data from the Ervin Committee report of 1974, Davis told the Privacy Protection Study Commission here recently.

About 16 agencies account for approximately 58% of the reported 8,000 systems of records and 90% of the federal computer inventory, she said.

The Defense Department leads the list, with 2,207 general-purpose computers, according to the GSA inventory. Treasury is second with 111 and the National Aeronautics and Space Administration is third with 67.

The Department of Health, Education and Welfare (HEW) is fourth with 64 and the Commerce Department is fifth with 63 systems.

According to inventories published in the *Federal Register* in August, the Department of Defense leads in numbers of record systems, reporting 2,100.

The Treasury Department is second with 996, HEW is third with 658, the Department of Transportation is fourth with 231 and the Department of Justice if fifth with 159.

As for the number of personal data banks, the Ervin Committee report of 1974 showed the Defense Department again leads with 478, of which 430 are automated. HEW is second with 61 personal data banks, of which 60 are automated, and Treasury is third with 46 personal data banks, of which 38 are automated, she said, illustrating the magnitude of the retrofitting problem.

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Attorney General Tables FBI Message-Switching Plan

(Continued from Page 1)

available would have been a statement from the White House," a source said.

In a letter to Sen. John V. Tunney (D-Calif.) and Rep. Don Edwards (D-Calif.), Levi said "much of the advice we have received regarding the FBI proposal has been critical of the concept of exchanging computerized criminal history information and of the contemplated role of the FBI in the proposed program.

"Some of this criticism reflects a measure of misunderstanding about the proposal. Nevertheless, this criticism reflects a widespread and genuine concern, which we share, regarding the privacy of criminal justice information and the proper role of the Federal government in law enforcement today.

"In my view it is essential that the questions raised in the discussion of the FBI proposal be authoritatively resolved before a decision on it is made," Levi explained.

The FBI refused to comment on the announcement, but after receiving the letter, Tunney issued a statement saying the attorney general's decision "will slow the frightening drift toward a highly centralized police force.

"I welcome his view that such complicated issues as message switching should be considered in a legislative context. Whoever controls criminal justice message switching will inevitably wield enormous power over the lives and reputations of all citizens.

"Giving this unlimited power to the FBI without careful scrutiny begs for abuse," he said.

Prospects for future FBI message switching are dim, Capitol Hills sources said.

Edwards reaffirmed that view in a statement issued in response to Levi's letter which said: "Today's announcement . . . regarding message switching . . . reflects a new awareness on the part of the executive branch that Congress must exercise its duty to set policy regarding authority of federal agencies.

"The Subcommittee on Civil and Constitutional Rights of the Committee on the Judiciary has begun working on legislation which in its present form eliminates the FBI as the conduit for . . . criminal justice information," he said.

In formulating policy related to criminal record information handling, "we must answer the questions, "How are the states best served? 'Can multistate problems be addressed without federal intervention' and 'Who should solve state criminal justice problems – the states or some federal agency?'

Honeywell Loyalty to Contracts

(Continued from Page 1)

maintenance, he explained.

While this "in no way represents a warranty" on Honeywell's part as to the long-term maintainability of the system "provided the entire system is installed at the new site within 30 days, the inspection and installation charges should be minimal," he said.

Honeywell users who choose to obtain maintenance service from another company should look to that company for this service, he said, adding "this policy protects the user as well as Honeywell.

After equipment has been delivered to the new user's site and the new user has signed the agreement for equipment support services Honeywell will provide the necessary inspection, installation and testing and advise the new owner on what work needs to be done, according to Douglas.

Since the new owner will obviously be without a maintenance contract, the work will be done at time and material rates, he said.

In explaining the company's policy change, Douglas said, "in the past we found we were precertifying equipment for maintenance at a location to be defined after equipment was stored in warehouses, allowed to deteriorate or was damaged."

Still another issue that has concerned users who either do their own maintenance or who have contracted for maintenance with a third party is the difficulty of getting spare parts, plus the $50/item charge for parts ordered.

According to Douglas, noncontract customers must allow the same lead time for spare parts as the field stocking staff. This is 39 to 52 weeks, he explained.

"Why should we be expected to deplete our field inventory to service noncontract users at the expense of our contract customers?" Douglas asked.

IBM Cardless 370s Feature Upgrades

(Continued from Page 1)

115 and first quarter of 1976 on the 125.

Costs of the new models will be higher. A 64K 115 that cost $3,235/mo rental or $122,150 purchase will increase 31% to $4,250/mo or $160,250 in the new configuration. A 96K Model 125 that was $5,355/mo or $201,650 will jump 12% to $6,030/mo or $227,050.

On the high end, a 196K Model 115 which was $4,275/mo or $159,050 will jump 20% to $5,150/mo or $191,850. A 56K Model 125 formerly $6,480/mo and $241,150 will go up 10% to $7,155/mo or $266,550.

IBM also announced several software enhancements. The Extended Telecommunications Modules (EXTM) Version 2 allows the 3790 terminal system and the 3606 and 3608 banking terminals to be used on the 115 and 125. EXTM Version 2 operates in a Systems Network Architecture (SNA) environment and costs $215/mo.

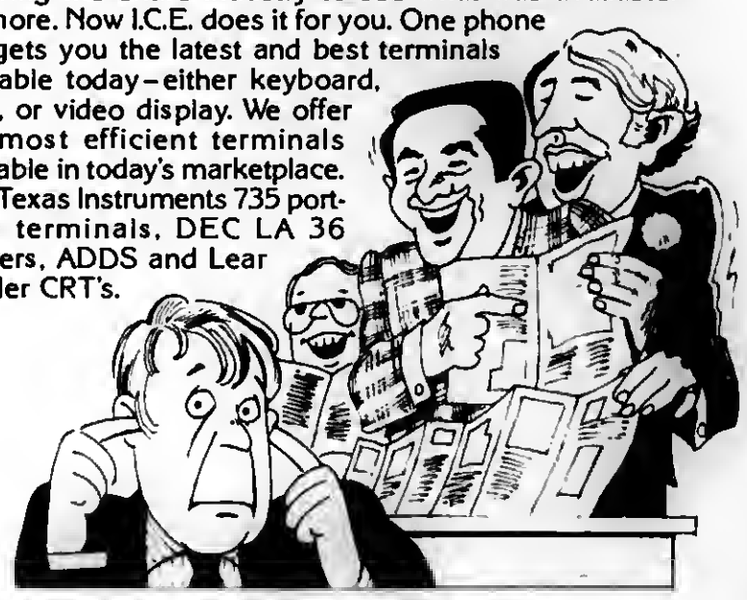
The Disk Operating System/Virtual Storage Entry Time-Sharing System is described as a small system for 115 and 125 users, but it can operate on any 370 using DOS/VS. The field-developed program costs $250/mo.

IBM also announced it has issued Release 32 of DOS/VS. An installation enhancement release called DOS/VS IER will be available in December for users who are first implementing the operating system. Both releases are available without charge.

If you use terminals, here are four reasons you should know I.C.E.

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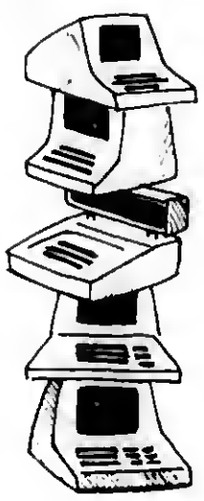
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Response to Questionnaire Poor

Effort to Upgrade Job Choices Stymied by Women DPers

By Catherine Arnst
Of the CW Staff

MINNEAPOLIS – Efforts at the University of Minnesota to upgrade women's occupational choices by compiling a statistical sampling of female DPers have met an impasse because of the lack of response from women in the industry.

The Center for Interest Measurement at the university is compiling statistics for the Strong-Campbell Interest Inventory, an instrument used to help people make career choices. The Strong-Campbell test is being revised to produce fewer sex-biased results, and occupational scales for women taking the test are being upgraded in terms of status and salary, Dr. Jo-Ida Hansen, director of the center, said.

The test, which is published by the Stanford University Press, originally contained lower status and lower paid career choices for women than men and had separate male and female forms. It now has only one form.

When an individual takes the test, the person's results are compared with a sampling of people already in a certain field as a whole and separately with those of the same and opposite sex.

Sampling Hard to Get

The center has had an extremely difficult time compiling an accurate statistical sampling of women in DP, Hansen said. "We had a hard time getting an initial mail list," she explained, noting the center tried several professional societies, including the Association for Computing Machinery, and got little response.

Finally, Hansen said, the Society of Certified Data Processors did offer assistance and sent out the questionnaire to 2,800 people in mid-July.

The center has received about 1,000 responses from men in DP as a result, Hansen noted, but only 45 usable responses from women. She would like at least 200 women to respond.

It will be two more months before the survey is completed, Hansen said, and she is still eager for more input from women in the field. Those who answer the questionnaire will receive an individualized profile, she added.

For women interested in participating, Hansen can be contacted at the Center for Interest Measurement, 101 Eddy Hall, University of Minnesota, 55455.

EFTS Unit Chided for DP Lack

(Continued from Page 1)

in computer matters to the deliberations of that important body."

It concluded with a plea for a congressionally mandated moratorium on "unnecessary EFTS developments" until the work of the commission has been completed.

Almost concurrently with Widnall's confirmation, the House of Representatives passed a bill revising the original schedule of reporting dates - which had become impossible to meet because of the long delay in naming the commission members.

For its part, the House included an extension of the reporting dates as part of a three-part bill it passed in late October. There is nothing in the bill's text that ties the extensions to the appointment of a new commission member who would be deemed a computer expert, such as Adapso proposed.

Ironically, the language setting up the reporting deadline extensions was added to the current legislation as an amendment, replacing a section which would have imposed the EFTS moratorium Adapso and various others have sought.

The new schedule, still subject to consideration by a Senate-House conference committee, requests a report to the congressional committees concerned with EFTS within six months of final enactment of the legislation. It also calls for the commission's final, formal report to be prepared within two years of the date of the chairman's confirmation.

The most immediate task Widnall faces is the naming of an executive director for the commission. This nomination, subject to confirmation by the Senate, is expected to be made in "a couple of weeks," the chairman said, and the first meeting of the commission itself should take place "before early December."

Decsystem-20 Coming With Virtual OS, T/S?

(Continued from Page 1)

ory bandwidth of "more than seven million bytes per second" under four-way interleaving.

The integrated "high-speed mass storage" controllers interface DEC's RP04 disk drives and TU16 tape drives to the data channels in the memory controller.

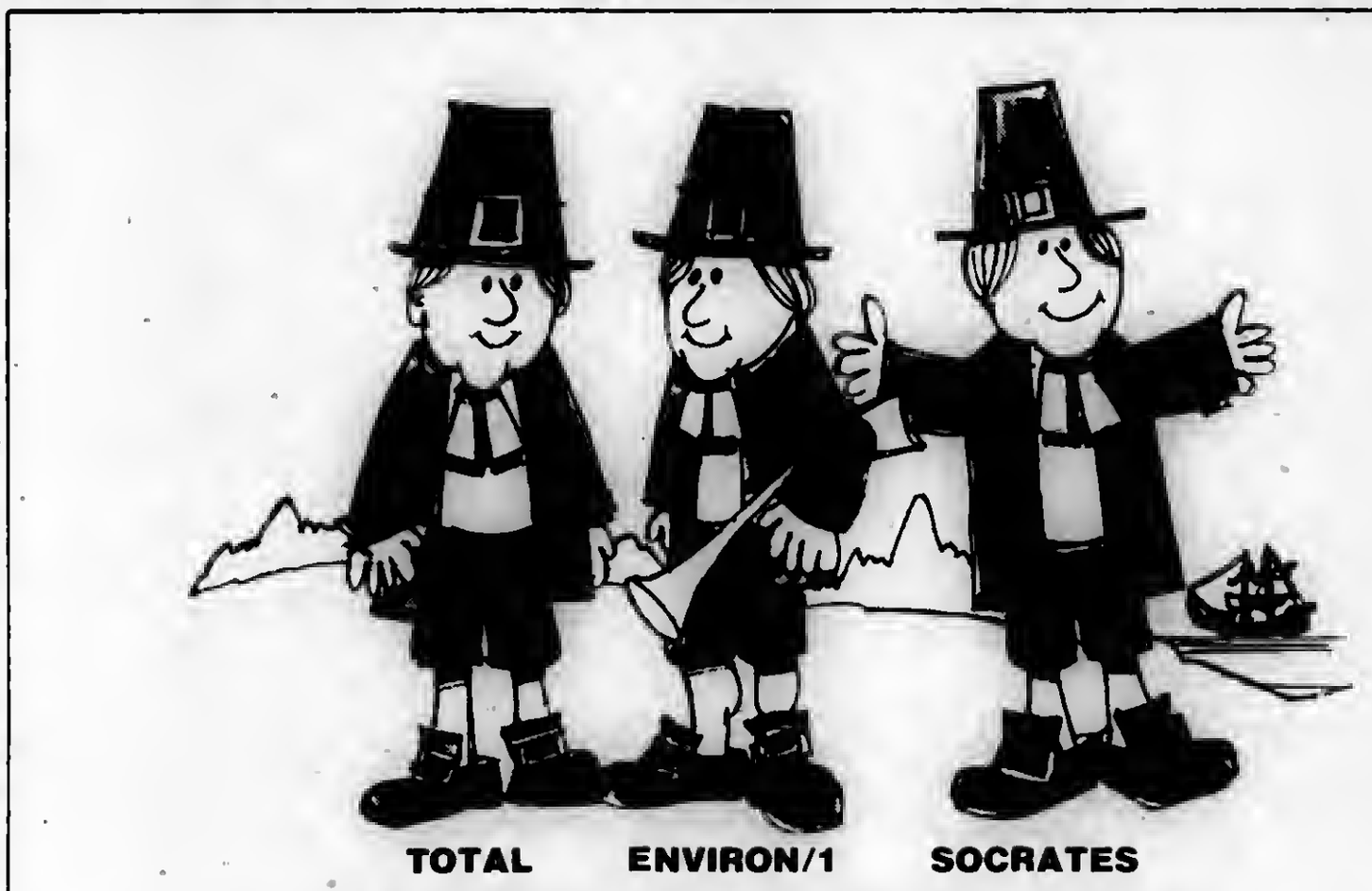
A DEC PDP-11 is used as a front-end processor for the Decsystem-20 and controls low-speed peripherals such as card readers, line printers and asynchronous communications devices.

It also manages console operations for the system, on-line and remote diagnostic analysis and microcode loading and system startup, according to DEC.

The operating system for the Decsystem-20 (Tops-20) supports program execution in user or Exec mode. Languages include Cobol, Fortran, Basic, APL, Algol, something called CPL and a macro-processor.

The system supports 383 instructions implemented in microcode but grouped into logical families for easier management. This extensive repertoire is said to enable programmers to use far fewer instructions to perform a given function, and compiled programs are described as "30% to 50% shorter" and faster in execution than programs on comparable computers.

No prices or announcement dates were listed in the guide or available from DEC spokesmen.



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Share Publishes Third Volume of CPE-Related Papers

CHICAGO – Share, Inc., the IBM user organization, has published for general distribution another volume of papers related to computer performance evaluation (CPE).

Like the two volumes published last year [CW, Sept. 4, 1974], this soft-cover book is made up of papers originally gathered by Share's Computer Measurement and Evaluation (CME) project. Bringing the publications "up to date," this volume covers the period from December 1973 to March of this year.

Studies in the latest book focus on the System Measurement Facility (SMF) and other accounting systems, software and hardware monitors, simulation and modeling and charging systems.

Other areas covered are operating systems, hardware evaluations, planning and forecasting and computer performance management.

User meetings sponsored by Share, Inc., have been generally recognized as good, useful and productive for attendees, but have not been open to the DP community at all. Publication of the first CPE volume was hailed last year as a real attempt by Share management to meet the organization's stated purpose of fostering the "development, free exchange and public dissemination" of technical information.

Share's CME project, managed by Dennis R. Chastain of the U.S. General Accounting Office, represents "one of the most complete up-to-date sources of information available," according to Share President Edward J. Farrell.

The first volume of CME papers – now out of stock – included selections from 1967, when the project was first organized, to November 1971. Volume II – still available in limited quanities – covered the period from November 1971 to December 1973.

Available separately for $25 apiece, the 751-page Volume III and 829-page Volume II can be purchased together for $40. Requests should be addressed to Share, Inc., One Illinois Center, 111 E. Wacker Drive, 60601.

IBM Blamed for 'Naiveness' in Contract Dispute

By Kathleen Quinn
Of the CW Staff

LOWELL, Mass. – IBM's "naiveness" is responsible in part for an unresolved contract dispute which resulted in the removal of the firm's equipment from the Lowell High School (LHS) DP center last June, according to William Collins, the Lowell School Department's business manager.

The department refused to pay $6,000 which IBM said it owed in peripheral equipment back rental at an increased rate because the city had failed to issue a purchase order in January authorizing the continuation of the contract.

Although "both parties were guilty of some negligence," IBM should have known from its dealings with other municipalities it cannot increase prices in a contract which no longer exists, Collins said.

"I don't care if it's Lowell or where it is – it's wrong," he added. Notices of increases are not considered "straight, legal documents," and that is where the whole problem lies, Collins said.

The situation came to the attention of Harry Petros, LHS' DP director, last March.

City officials assured him at that time that, although the city cannot draw up a contract after the fact for services already delivered, something would be arranged so the center would not lose the equipment, Petros said.

"Then something weird happened."

In May, "out of a clear blue sky," he received a letter from IBM informing him the peripherals would be removed in 30 days – during a time when the equipment was needed to process students' report cards.

Petros feels the failure to resolve the issue may have been due in part to the recommendation of a consultant who, Petros said, believed the equipment was unneeded.

The decision was "that of the Lowell School Department," according to the consultant, however.

The city has since signed a contract with Unit Record Service Co., Inc. in Stoneham, Mass., for IBM equipment.

Managers' Chances to Move Outside DP Rising

By Toni Wiseman
Of the CW Staff

NEW YORK – Opportunities for senior DP managers to move into general management positions are increasing considerably, according to a career paths study conducted by the Diebold Group, Inc.

Although only 25% of the managers questioned said their predecessors had been promoted outside the DP division or had moved laterally into the mainstream of general corporate management, more than 40% now see valid opportunities for their own promotion outside DP, according to Joseph Ferreira, director of the research program.

"The movement is in two ways," Ferreira noted. "There is a very noticeable trend to promote personnel with general management experience to the position of senior DP executive.

"Whereas 80% of the current [DP] managers contacted were drawn from within the [DP] division, almost one-third of future [DP] managers will be taken from outside the division," he said.

Although very few chief executive officers questioned saw any reasons the senior DP executive should not be promoted to senior corporate positions, Ferreira said the DP executive's career path outside that department might well depend on his ability to make senior management aware of his capability in the area of general management.

The Diebold survey also found that the DP division has risen in corporate importance during the last decade. This is reflected in the fact that two-thirds of the DP managers surveyed now report to an officer no more than one level below the president.

It was also found that, although a technical background is needed, technical expertise is not the prime qualification sought by most of the senior managers when filling the senior DP position.

In fact, most executives did not even rate it among the top three qualifications for the job, Ferreira noted.

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Despite Cutbacks in Other Areas

DP Staffs Have Grown Since Last Year, Study Finds

By Toni Wiseman
Of the CW Staff

LOS ANGELES – While the recession has prompted a substantial number of companies to reduce their overall production of products or basic services since last year, there has been an overall general growth in the size of the DP staffs.

In a survey of 148 companies, 47% reported cutbacks in production and 56% closed down or cut back plant operations, according to a study conducted by the Jarvis Walker Group here.

These firms, additionally, cut their corporate employee staff by a total of 62%, the report noted, yet half the companies actually increased their DP facilities, and 35% have maintained DP departments at the same size and operating levels.

There has been a gradual – though controlled – growth in the size of DP staffs over the past five years, according to the report. Staff size has, however, not kept up with the overall growth of corporate DP budgets.

Sixty-two percent of the firms reported maintaining larger DP staffs today than in 1970, while during the same period 83% increased their total DP budgets.

Of these, 41% had a budget increase of 1% to 25%, 26% of the firms reported increases of 26% to 50%, and 24% had increases of 100% or more.

Payrolls have not, however, kept astride with facilities growth.

"Among the companies reporting, while half reported increasing the size of their DP installations in the past year, only 36% increased staff size during this same recessionary period," said Dan Jarvis of the Jarvis Walker Group.

"At the same time, 27% have at least maintained staff at the same level as a year ago.

"Thirty-seven percent of the companies responding did cut back DP staffs – but this was far less than the 62% which had reduced overall payrolls," he noted.

A more detailed study of budget allocation showed that 72% of the firms allocated 20% or more of the DP budget to developmental purposes in comparison with allocation for work output; at least one of every four companies allocated half of its budget to developmental work, and only 6% devoted less than 10% of the budget for this purpose.

This correlated with the finding that 80% of the firms reported data processing as an in-house function, with more than three-quarters of the firms using internally developed software to handle 80% or more of their needs.

All used internal programs for more than half of their requirements while only 9% used proprietary packages for 30% to 50% of their requirements. None of the firms reported using outside software for more than 50% of their work.

Firm to Investigate DP 'Complication' In N.Y. Lottery Mixup

ALBANY, N.Y. – The research firm of Arthur D. Little (ADL) in Cambridge, Mass., has been called in to study the "computer complication" which resulted in Gov. Hugh Carey's suspension of this state's lottery program. It was discovered that duplicate- and even triplicate-numbered lottery tickets were being sold, a spokesman for the governor said.

ADL was expected to release its findings to Carey last week, but Harry O'Donnell, the governor's press officer, said Carey will study the ADL report before making the findings public or resuming the state's lottery program.

Only when a "fail-safe system of computer programming and ticket production and selection can be established will the lottery games and drawings be resumed . . . The people who buy lottery tickets will be protected," Carey said, according to the press spokesman.

The problem was reportedly traced to "a programmer in the data processing section of the Racing and Wagering Board" where the tickets are prepared. The programmer, who was shown a batch of the ticket run, acknowledged he had made an error in programming the Oct. 31 Colossus drawing which offered a $1.4 million jackpot.

DP officials on the Racing and Wagering Board refused to comment further on the nature of the problem, except to say that the programming error has been corrected.

One added, however, that, since the error brings "the integrity of the whole system under question," the research firm was called in to set everyone's mind to rest.

A lengthy suspension of the lottery could cost the state a considerable amount of money, according to a spokesman for the State Budget Division.

The lottery was expected to bring about $44 million into this state's treasury during the current fiscal year.

ICCP Extends Deadline For CDP Applicants

CHICAGO – A record number of responses to the announcement of the Certificate in Data Processing (CDP) examination this year has encouraged the Institute for Certification of Computer Professionals (ICCP) to extend the deadline for applications.

Requests for applications have already reached 20,000, more than double the number for last year, according to the institute, which will continue to accept applications beyond the originally announced Nov. 15 deadline.

The CDP exam will be held at more than 100 selected test centers throughout the U.S. and Canada and 10 foreign sites. Specific requirements for this year's examination are detailed in the "Certificate in Data Processing Examination Announcement and Study Guide."

Both the study guide and application forms for the exam are available from ICCP at P.O. Box 1442, 60690.

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Software Test Results Identical

Simulation Confirms Proposed Encryption Algorithm

During the past three years, interest in information security has been rapidly growing – not only for the safeguarding of fiduciary and other files having intrinsic value, but for improving access control over sensitive data, including personal information, while procedures are being upgraded to meet present and anticipated privacy requirements.

Vast amounts of money and high-grade talent have been expended in defining and developing more secure systems. Those who have studied the problems thoroughly are among the least complacent about the adequacy of their solutions. Systems once thought highly secure are viewed as readily penetrable.

One basic tool that is clearly definable and has broad applicability is the encryption of data into cipher while in transit through nonsecure parts of systems to make it less readily accessible to unauthorized users.

The proposed federal standard algorithm provides hard cipher. Herbert Bright believes that, carefully applied, this algorithm will be economically infeasible to break, so that only loss of access control over key or plain text will be realistic cause for information security breakdown.

By Herbert S. Bright
Special to Computerworld

An exact software simulation of the proposed federal standard algorithm for data encryption recently published by the National Bureau of Standards (NBS) [CW, Aug. 25] is being made available by Computational Planning, Inc.

The simulation is seen primarily as a test tool for users in and out of government who are deciding whether to apply the algorithm.

The NBS announcement stated that "data may be protected against unauthorized disclosure by generating a random key and issuing it to the authorized users of the data. The cipher that has been produced by performing the steps of the encryption algorithm on data using a particular key can only be returned to the original data by use of the decryption algorithm using the identical key.

"Unauthorized recipients of the cipher who may have the algorithm based on a user-generated key thus provides a basis for compatible cryptographic protection of computer data while preventing unauthorized use of the data in cipher form."

The proposed standard also stated that "only hardware implementations of the algorithm . . . will be considered as complying with the standard."

The user tests could involve a broad array of uses of cryptographic techniques, but we at Computational Planning expect the one of widest interest to be the checkout of cryptographic methods in application programs and procedures without requiring access to other than general-purpose computing hardware.

Other possible applications of the software algorithm could include:

- "Indirect encryption" by generating a binary stream which may be combined with a data stream to produce cipher. According to the proposed standard, "The cipher produced with the latter technique has the same high degree of cryptographic protection as the cipher produced if the data were entered directly into the data encryption device."
- Generation and test of encryption checkout data for designers, maintainers and users of encryption hardware.
- Protection of data where economically feasible and compliance with the proposed federal standard is not applicable. The cost per encrypt or decrypt of a 64-bit data element, using a large-scale machine and a preprocessed key (i.e., with prestored key schedule tables), will be less than .1 cent at typical service bureau prices.

	KEY	DATA	CIPHER (ENCRYPTED)
		Test A	
IBM	1334577 99BBCDFF1	0123456789ABCDEF	B5EB13540F0AB405
	1334577 996BCDFF1	5555555555555555	6F159B9AB7B415BC
Univac	13345779 9BBCDFF1	0123456789ABCDEF	85E81354DFCAB4C5
	13345779 9BBCDFF1	5555555555555555	6F15939AB7B4158C
NBS	13345779 9BBCDFF1	0123456789ABCDEF	B5EB13540F0AB405
	13345779 9BBCDFF1	5555555555555555	6F159B9AB7B415BC
		Test B	
IBM	7CA110454A1A6E57	01A1D6D039776742	690F5B0D9A26939B
	0131D9619DC1376E	5CD54CA83DEF57DA	7A389D10354BD271
Univac	7CA110454A1A6E57	01A1D6D039776742	690F5B0D9A26939B
	C131D9619DC1376E	5CD54CA83DEF57DA	7A389D10354BD271
NBS	7CA110454A1A6E57	01A1D6D039776742	690F5B0D9A26939B
	0131D9619CC1376E	5CD54CA83DEF57DA	7A389D10354BD271

Samplings for both Test A and Test B show encryptions handled by Computational Planning software on an IBM 370 and on a Univac 1108 are identical with data prepared by NBS.

- Maintenance of a preprocessed key pool. (Key schedule tables from the last eight keys processed are stored for immediate use. On each entry from a CALLing program, the routine checks to determine whether the key currently being presented to it is the same as any key that is in the current pool. If so, it bypasses the key calculation; otherwise, it processes the current key to generate tables replacing those least recently generated.)
- Execution of the odd-parity check on key transmission (specified by NBS to be optional under the standard) under selective control of user-set switch.
- Conversions between octal and hexadecimal notation for convenient visual checking of tests expressed in hexadecimal digits when using software/hardware complexes that do not support hexadecimal (e.g., IBM Fortran "Z" format) notation.

The cryptographic algorithm capability is being made available for several machines in an extended version of the Beef2 nonnumeric language-extender software package.

Beef2 is a library for performing character- and bit-string data element handling in Fortran and Cobol programs that are themselves written in conformance with the corresponding standards or for use in support of Assembly language or any higher level procedural language that can CALL subroutines.

NBS has developed two sets of test data for validating implementations of the algorithm. What we have called Test A is a set of 24 64-bit key/data pairs designed to demonstrate the power of the algorithm by showing the large effects on cipher of small changes in either data or key and the behavior of the encryption process on a variety of bit patterns.

Test B is a set of 19 key/data pairs generated as pseudorandom numbers and chosen because the corresponding 19 encryptions were found experimentally by NBS (and confirmed independently by us) to reference at least once each of the 256 entries in the "S-box" substitution cipher tables.

Correct execution of Test B (in which all cipher produced correspond to presumably correct cipher from a different implementation and in which all of the S-box table entries are referenced at least once) provides a high order of confidence in the correctness of encryption for any values of key/data.

When an encryption/decryption process has been shown to encrypt correctly a well-chosen set of key/data pairs (such as in Test B) and has been shown to recover the original data intact by decryption of the corresponding cipher, we feel the process is ready for test use.

Results of exercise of the first two Beef2 cryptography extensions released, executing Tests A and B as described above, are given on the accompanying tables. In each version's test the column headed "Cipher (Encrypted)" gives the result of machine encryption.

It may be seen that, in all cases of Tests A and B, both machine versions give results identical to those given by NBS.

Bright is president of Computation Planning, Inc., Bethesda, Md., which developed and markets Beef2.

"Cheese."

Honeywell minicomputers help in the production of film for cameras.

A major camera manufacturer uses Honeywell minicomputers in its automatic warehousing and inventory control system for its film plant. The minicomputers:

- perform piece counting for automatic packaging equipment
- record completed inventory entering the warehouse
- control product movement within the warehouse via automatic cranes
- prepare management reports

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Canadians Like Way System Spots Illegal Gas Tax Refund Requests

OTTAWA – A government department here is "very pleased" with the initial operation of a computer system designed to spot illegal attempts at gaining refunds of Canada's recent gasoline excise tax.

The 10 cent/gallon tax law, which went into effect June 24, allows tax refunds on gasoline used for business purposes.

The Excise Gasoline Tax Division of the Department of National Revenue has already rejected "a good deal of applications for excise tax refunds for various reaons," according to Fred Bourdon, head of the division's Legislative Interpretation Unit.

The computer programs were designed to spot any inconsistencies which could point to an illegal refund attempt, Bourdon indicated.

Bourdon would not divulge the nature of the system's checks and balances which the division used in writing the programs.

DP for the Dogs

No 'Love Matches' Allowed for Canines

By Catherine Arnst
Of the CW Staff

MOUNT PROSPECT, Ill. – The perfect match is not made in heaven as far as selective dog owners are concerned; a computer service does the job for some canines here.

Date-a-Dog was started in May as a computer-assisted mating service for canines. The unique service is the brainstorm of Sharron Spitz, owner of Going to the Dogs, a pet and grooming shop. She had been manually matching studs (male dogs) with females in heat for her customers. Since her drawers were overflowing with requests, she decided to automate.

There are presently 400 studs in the data base. To take part in the service, an owner pays $10 and fills out a computer card listing 14 items about his dog, including age, breed, defects and attributes.

When a female is in heat (about two weeks out of every year) the computer is activated and a list of eligible males is produced from which her owner can choose.

Edgewater Data Processing does the matchmaking on a Honeywell 2020 disk system. It is the only service of its type in the country, Spitz said, and the response to Date-a-Dog has been "phenomenal."

The attraction of such a selective system is to "upbreed a dog; to breed out any genetic defects," Spitz said. A large number of show dogs are listed in the system, she said, because it is good advertising (an owner can charge a stud fee anywhere from $50 up to $400 for the use of his dog).

Spitz expressed some disenchantment with the system though: "People can drive you crazy. They're more neurotic about their dogs than about their children," she said.

Problems Arose

"There are a lot of different problems we hadn't thought of when we decided to computerize," she continued. "When we were doing it ourselves, we knew all the dogs. Now, people don't always fill out their cards honestly. Everyone thinks his dog is perfect and doesn't have any defects."



CW Photo by A. Dooley

Two members of an emerging market for DP services discuss the pros and cons of automation in the animal world.

A lot of interest has been shown in the service, which only covers Illinois, and there have been several requests for franchises. Spitz has no plans for expansion, however.

"I think Date-a-Dog is just a shot in the dark – it's a faddish thing. Of course, if it continues for four or five years, I would be proved wrong." she said.

DP Helps Find Lost Dogs

By a CW Staff Writer

FRAMINGHAM, Mass. – A computerized dog directory is in the planning stages here to aid owners who suddenly find themselves bereft of man's best friend.

By April 1, The Canine Communications-Control Catalogue will list the name, description, license number and phone number of all dogs in the Framingham area and eventually will be expanded to list all of the 126,000 dogs in Middlesex County.

When a dog is found, a dog officer only has to look up its license number, call its home and a family is brought together again.

The directory, said to be the only one of its kind, was the idea of Thomas C. Corkery, Middlesex County Coordinator of Canine Control. He estimated there are approximately 20,000 dogs lost per year in Middlesex County and 40,000 to 45,000 in the state.

When a dog is found now, it is held in a pound, at a cost of $2 per day to the owner, for up to seven days, after which it is put to sleep.

Corkery expects the directory to speed the return of lost dogs to their owners, saving them the holding fee and saving the county the expense of caring for the dog.

The program is being set up by the students of Keefe Regional High School.

Test Area

The plan so far is to use Framingham as a testing area. Students will visit each dog owner, collect all the pertinent information and then feed the data into the computer.

Christopher Cassidy, Keefe's computer coordinator, expects the program will be tape-based and written in ANS Cobol.

The printout listing each dog will then be reprinted in book form, and a copy of the directory will go to every dog officer, police department and "anyone else who requests one for a legitimate use," Corkery said.

Eventually, Corkery plans for the directory to be statewide and even envisions an exchange of similar directories between every state. "I've already received hundreds of letters from all over asking about it," he said.

And the dog owners? "They're delighted," he said.

A-Ok.

Honeywell minicomputers are helping explore space.

NASA is using Honeywell minicomputers in its billion-dollar Viking program which plans to soft-land a space vehicle on Mars. The minicomputers are:

- monitoring and checking landing components from assembly to launch

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CW 10/19

But Maybe Not This Civilization

Models Show Human Race Would Survive Nuclear War

By John Hebert
Of the CW Staff

WASHINGTON, D.C. – The human race – but not necessarily this civilization – would probably survive a "massive nuclear war," according to a recent National Research Council (NRC) study that relied heavily on computer simulation models.

Calculations from two atmospheric simulation models formulated at Lawrence Livermore Laboratory (LLL) indicated between 25% and 50% of the global ozone might be destroyed in the year following an 11,000-megaton nuclear blast, according to Dr. Mike MacCracken, deputy division leader at LLL's Atmospheric Geophysical Sciences Division.

The 11,000 figure was chosen arbitrarily; it is one-half the absolute total detonation capability the U.S. and the USSR reportedly have.

A 30% ozone reduction causes a 100% increase in ultraviolet radiation, MacCracken said, adding researchers have indicated changes of this magnitude could severely affect animal and plant populations and increase the incidence of skin cancer.

"For a transient period of about 10 years, life would be very difficult for people not in the immediate target area," according to Dr. Donald C. Shapero, NRC staff officer for the study, "Long-Term Worldwide Effects of Multiple Nuclear-Weapons Detonations."

"The recent studies indicated other considerations must be made in dealing with nuclear war and its effects," according to Ralph Smith, director of public relations at the U.S. Arms Control and Disarmament Agency (Acda).

The one-year study was undertaken by NCR at the request of Acda.

Noncombatants Warned

In transmitting the study report to Acda, Philip Handler, president of the National Academy of Sciences (NAS), warned noncombatant countries taking any comfort in the findings:

- Regions of high radioactivity could occur far from the detonation sites.
- Major and unfavorable climatic changes might occur.
- Were the U.S. and Canada involved, two-thirds of the grain in international commerce would disappear.
- Public health resources in the surviving nations could be severely affected.
- The economic, social and political consequences of the resultant worldwide terror cannot be predicted.

"Although the principal findings of this report are encouraging in a sense, this report further underscores the urgency of halting the proliferation of nuclear weapons and, as soon as possible, reducing the world's nuclear arsenal," Handler emphasized.

The computer simulation models used were part of a separate study, the Climatic Impact Assessment Program, which was on-going at LLL while the study was being performed, MacCracken said.

Each of seven NRC committees were assigned an area to study such as the effects on atmospheric and acquatic environments, and genetic, agricultural and other realms.

"The atmospheric study modeling was done by one of the seven research groups, but the resultant data was used for the biological groups as well," MacCracken said.

"We made rough estimates of ranges of variables, which the biological committees looked at" in assessing the effects from their standpoint, he said.

"All of the other studies used the data from the atmospheric model in some way to perform predictive calculations," MacCracken said.

Three Programs Used

There were three different programs used at LLL on one of its four Control Data Corp. (CDC) 7600 systems, he noted.

The first program dealt with the chemical makeup of the stratosphere to determine vertical profiles of atmospheric distribution or transport of radiation over a period of time from surface level to an altitude of 55 kilometers, he said.

A two-dimensional model provided the basis for the second program, detailing horizontal radiation effects at ground level, in other words, latitude and longitude, MacCracken said.

A third program outlined the long range increases in ultraviolet radiation and provided a basis to study the effects.

The NRC report is available for $8.50 from the NAS Printing and Publishing Office, 2101 Constitution Ave. N.W. 20418.

Funded by U.S. Government

Employment Offices Get DP Assistance

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – The Federal Government has begun funding the second part of a U.S. Employment Services project whose first part has yet to prove itself.

The House voted $20 million and the Senate $10 million as the first step toward implementating a five-year plan to install a computerized job-matching system in every state Employment Security office in the country.

The job-matching system will, in theory at least, work in conjunction with a currently operational job bank system.

The concept of the program dates back to 1968, when Richard M. Nixon used the idea as a key campaign pledge.

By 1970, 42 Department of Labor computerized job banks were in operation [CW, July 29, 1970]. Today, 40 states have job banks, but there are no hard figures on their success [CW, Aug. 20, 1975]. In fact, those connected with the program cannot ascertain if any workers have been placed through the system.

In 1974, the Comprehensive Employment and Training Act expressly called on the Secretary of Labor to "establish and carry out a nationwide computerized job bank and matching system on a regional, state and local basis."

A 15-member panel sponsored by the National Manpower Policy Task Force studied plans to expand the job banks into job-matching systems in 1974 [CW, Feb. 27, 1974].

The job bank currently in use in the state Employment Security offices lists openings available around the country. The heart of the system is a computer in Oklahoma which formats the listings and produces microfilm copies which are then sent daily to each state office.

The job-matching operation would mesh this listing with another bank consisting of people looking for work, categorized according to their skills, willingness to relocate, etc.

The matching would start on a local basis, but would be expanded nationwide if there was an unusual job in a state but no one to fill it.

The fact remains that only the semicomputerized job bank is running at present.

The job-matching portion has not yet been instituted because "the mechanics of it are very, very complicated; we don't know how well it will work in terms of job matching," according to Jack Hashian of the Department of Labor's Manpower Administration.

There are currently pilot matching programs, in Utah for instance, "but they're not widespread and Utah is so small it doesn't [represent], because of its population and work force, a really good pilot for us to emulate," he noted.

Batch, On-Line Matching

The matching could be done both batch and on-line, Hashian said. It would initially be done in a batch mode "because of the relative unsophistication of the set-up, but eventually the idea is for a guy to walk in and, in real-time, his characteristics would be fed into the terminal and bingo the job," he explained.

"And if there's no job, he would be fed in every day to see if anything comes up that matches his needs and skills."

Hashian stressed the need for a mechanical bank since "now we just write the information down on a card and, quite frankly, that card is just filed if there isn't a job available that day.

"In most state operations, and most are crummy, there isn't the personnel available to keep searching the manual files, so the poor guy thinks he's in line for a job and he never hears from the office again," he said.

Hashian is hopeful that, once the system is running, it will mean a tremendous increase in the number of people using the employment service, "but they have to put the computers in first.

"The whole hardware question is the important thing at this moment," he said. "That's why the money is needed."

Hashian noted the planning is "going ahead full blast for the job-matching system, but frankly it's going to take years and years for that to develop into something highly useful, to match the ideal of the concept."

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Honeywell minicomputers help keep the presses rolling.

A large Southern daily newspaper uses Honeywell minicomputers in its computerized typesetting system. The minicomputers handle:

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Federal Agency Uses DP In Selecting Food Vendors

By Nancy French
Of the CW Staff

PRAIRIE VILLAGE, Kan. – The Department of Agriculture's Commodity Office here is using remote batch-processing equipment and computer models to analyze bids and select contractors for food items for federal programs such as the school lunch program.

"When you're buying for the whole county and ordering by the car lot, analyzing the bids to determine what is really the lowest priced offer is complex enough given all the variables involved such as package size, multiple delivery points, transportation rates and so forth," Pat Weaver, systems analyst for the Agricultural Stabilization and Conservation Service Data Systems Division, pointed out.

However, because commodity prices fluctuate so much from day to day, analysis must be completed and contracts awarded 24 hours after bids are opened, vastly compounding the difficulty, she said.

How System Works

According to the way the system works, suppliers who wish to bid on a given contract must submit their bids by 4 p.m. on the date due. At that time, commodity analysts open and review the bids.

Sometime before the 4 p.m. deadline, operators already will have keypunched the orders placed by each delivery location. Then, after the bids have been opened, two or three operators work steadily for about two hours keypunching price information and the contractors' delivery capacities from the bids submitted.

When cards are compteted, they are fed into a Mohawk Data Systems 2400 remote batch terminal which transmits the data over dedicated lines to a Univac 1108 system in Fort Collins, Colo.

The processing is done there, and at about 9 p.m. the resutts of the competition are printed out in list format on the 2400's printer in Prairie Village.

The fotlowing morning, the results are reviewed by the commodity analysts for a final decision. Although the computer model may have found the optimum solution, analysts may decide the prices are too high and postpone purchase of certain items, John Bussone, systems analyst at the Prairie Village center said.

After the decision is made to buy, wires are printed out on the 2400, detailing the purchased items, the destination points and so forth, and these are sent via Telex to the vendors involved.

In a typical bid situation, 50 to 100 contractors submit proposals to supply food products to some or all of 100 to 800 destination points, Weaver said.

Delivery costs may be included in the offer or added to the offer price separately prior to analysis.

Although any firm may submit a variety of bids which in total might exceed its production capacity, the Commodity Office would not wish to make awards that do. So, to assure this does not happen, each firm must provide production-capacity information by time period, package size and so forth.

The model then determines the set of contract awards that minimize the total purchase cost white meeting the delivery requests made by all destinations and staying within the production capacity of each firm.

The most frequently used approach to finding the teast cost sotution is a revised version of the Simplex linear programming technique, developed from a Univac system, Bussone said.

While it is most flexible, it is also time-consuming. So, in many situations, a transportation algorithm can be used to obtain an equivalent least cost solution, he said.

However, in cases where the destinations have not submitted their request for commodities in multiples of fixed delivery-unit size – the standard 100,000-lb car tot – an integer linear programming method is used to assure car lots are not split between vendors.

In this case, the solution is not always a "least-cost sotution."

A Dubious Distinction

PARIS – A computer study conducted in France decreed that this country's 52.5 million citizens are not the rugged individuals they are reputed to be.

Not only did the survey provide a detailed statistical profile of the French, it discovered the prolotype of the average French person and named her Madame France.

This honor was bestowed on 28-year-old Jeanette Avelange, a statistician in a milk plant office, for the distinction of being completely average.

She has light brown hair, grew up in a small town in northern France where she attended mass every Sunday and graduated from high schoot.

She was pregnant when she married her husband, Jean-Claude (a truck driver, who said, "I am proud of my wife" when told of her new title) and is the mother of two children.

Even her opinions fit the computer profile. Madame France considers herself a Catholic, but does not go to church. She takes contraceptive pills, but is strongly opposed to abortion, which she calls murder. She thinks crime is a growing problem in France, but opposes the death penalty.

Avelange's wish for thc world is that "everybody would be happy, no poor, no rich."

The profile of the typical French person was based on interviews with 2,000 men and women by the French Institute of Public Opinion and reflects what one newspaper termed "the Increasing French propensity for self-identification by computer rather than through the thoughts of Descartes, Camus or Sartre."

The average size of men is 5 ft 6 in. and 154 lbs and of women (51% of the population), 5 ft 2 in. and 130 lbs.

The average family has two children and lives in a detached home in an urban area other than Paris. While 84% consider themselves Catholic, slightly more than half do not go to mass and do not confess their sins to priests. Priests ought to have the right to marry, according to 70%.

String beans.

Honeywell minicomputers are helping a food processor.

At a large food company Honeywell minicomputers make the processing and distribution system more efficient by:

- handling communications from remote locations to the central site

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Editorials

Unearned Revenue

AT&T's determined campaign to force unnecessary protective devices onto data communications and other users has at last been stopped dead in its tracks by the Federal Communications Commission (FCC) [CW, Nov. 12].

There is no doubt that the body will still develop some last-minute regulatory reflex actions, but after that it should die a well-deserved death.

But that should not be the end of the matter. The Data Access Arrangement (DAA) was a rip-off.

It was conceived as a marketing ploy to salvage some revenue for the Bell System after the FCC said it saw nothing wrong with connecting noncarrier equipment to the dial-up telephone network.

The justification for the DAA and other connecting arrangements was the perceived harm AT&T always saw lurking in the shadows. But it never quite managed to transform that perceived danger into a tangible threat with specific examples.

In one recent last-ditch effort, AT&T attorneys attempted to show filmed sequences of the havoc that could be caused when 110 volts was applied directly to an enclosure housing some terminal equipment. The examiner hearing the AT&T case became so insensed at this far-out example, he threw out the Bell "testimony."

That incident was typical of the way AT&T tied up numerous regulatory proceedings since 1972 attempting to justify its case claiming harm to the network.

In addition to the regulatory foot dragging, there is a larger unresolved question. Under the interconnection tariffs, users were required to pay monthly rental to the phone company for their DAAs. Even though a single DAA was not a costly item, averaging less than $10/mo, there were large companies that had rooms full of the boxes.

Now that the FCC has ruled that the necessary protection can be built into modems and other equipment, some thought should be given to reimbursing users for the cost of the DAAs.

We propose local phone companies be required to give users a credit up to the total each has paid for its connecting arrangements through the years. It is inconceivable that the phone companies be allowed to keep this revenue just as though they had earned it.

Interested in Benson's Book?

For several years, Miles Benson has been writing columns for *Computerworld* about real projects which have failed for any of several reasons: mangement shortcomings, technical problems, etc. One of these columns is on Page 15 of this issue of CW.

It has been suggested that CW compile these articles, which number about two dozen, and ask Benson to update them where appropriate, and offer them to our readers as a package.

To help us measure reader interest in such a book, please use the coupon below. This is not an order form: please send no money.

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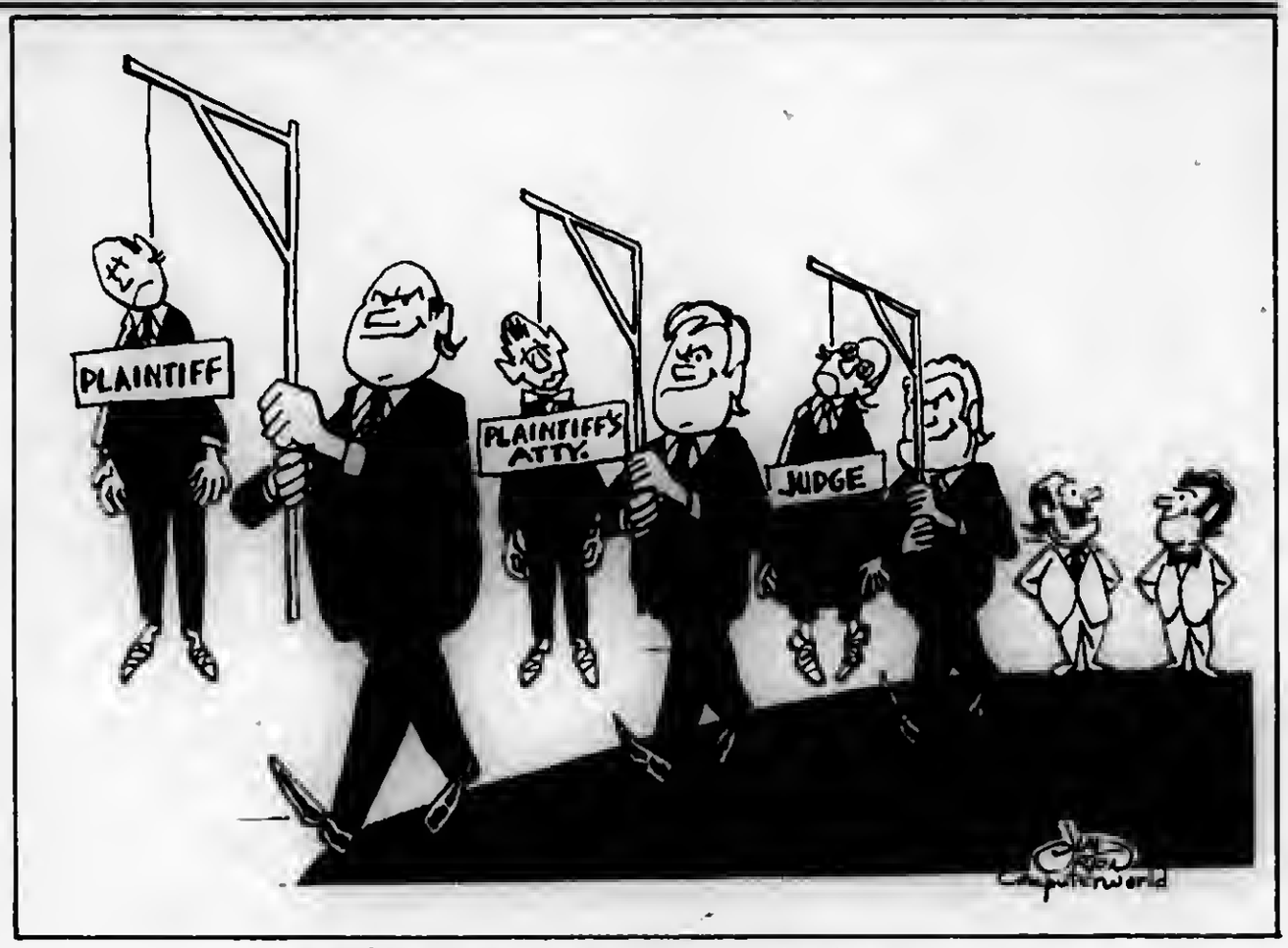
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'Must Be IBM's Involved in Another Lawsuit . . .'

Letters to the Editor

Manager Who Can't Get System To Work Should Polish Up Resume

Ed Tunstall's comments about NCR and whether they are in the computer business are truly remarkable.

In the first place, if I had a DP or operations manager working for me who was unsuccessful in making a computer work over the course of two years, and then, instead of getting rid of the equipment, wrote letters to the editor, I would ask him to polish up his resume.

As a fifteen-year user of NCR equipment (the 304, 315 and now the Century 200), I would have to disagree that "NCR never really entered the computer field" or that "Grosch was right all the time."

Here at Midland Cooperatives, we average about 20 hours per day or over 430 hours per month on our 128K Century 200.

During 1974 and 1975, we have averaged three hours and 20 minutes of downtime per month, including reruns because of hardware failures or problems. That comes out to .77% downtime – less than 1% of the compute time.

I am not sure what Tunstall or his operators are doing to deserve the problems he is experiencing, but there is no question in my mind about the kind of uptime that is typical among the Century user base.

Don Masterson

Minneapolis, Minn.

NCR Performance Exceptional

In response to the letter from Ed Tunstall titled, "Grosch Right: NCR Never Entered DP Mart" [CW, Oct. 15], I would like to interject our experience with NCR equipment.

We run orders three times a day on our machine, and in two years we have never missed a day printing orders.

We started with an NCR 100 and upgraded to an NCR 101 during this time period. I think this exceptional performance reflects the quality of the service we have gotten from NCR.

Gary Oliver

Chattanooga, Tenn.

Professor Should Enter Real World

The article by Jack M. Wolfe titled "Women Don't Want Promotions" [CW, Oct. 15] was absurd. Perhaps the professor should get out of the cloistered halls and into the real world of business.

I gravely question his so-called "statistics." My experience over eight years in DP would strongly contradict his assertions.

First, women are likely to resign when their husbands are transferred to other cities, but women are less likely to change jobs for other reasons, e.g., low salary, poor working conditions.

I have never in eight-years experience known a woman to return to a position for which she was originally trained, such as teaching, etc., as Wolfe suggested.

Furthermore, I have never known any woman in DP that did not want positions of responsibility, supervisory or other. Special hours are more likely related to nonmanagerial jobs than not. My managers never accompanied my project team to a site for graveyard-shift time.

In conclusion, I can only suggest that Wolfe's article can be based only on opinion. My experience would indicate none of it is true. Perhaps, he should interview some women the next time.

Mary E. Lowe

Respect for Single Life Needed

Is the real issue that "Women don't want promotions" or that women have to make choices? Yes, women put their families first and, of course, that means occupations second. Men have always been able to put occupations first and are respected for it.

Women who make it in a supervisory capacity are either super strong physically and mentally – handling two occupations simultaneously (at home and on the job) or single without families.

Until single life is respected as greatly as the married way, I think women will continue to put careers second.

Carol Mather

Cedar Rapids, Iowa

Depreciation a Reality

Two statements in the Reader Commentary by George Warren on the Cash Assets of IBM [CW, Sept. 17] suggested to me that, not only is the competency of Warren to interpret financial reports, but also the editorial competency of *Computerworld*, to be questioned.

The statement in the latter part of the article, "Much of this revenue is now charged to depreciation, rather than being added to earnings" implied that IBM could ignore the wearing out of materials originally recorded as assets. They might just as well record all current expenses as assets rather than using them to "reduce earnings."

The other statement was "IBM receives about 46 cents of gross income from each dollar invested in plant and rental machines, but only about 8 cents from each dollar held in cash or marketable securities." I assume that the 46 cents is before the expense of operating the business, just as the 8 cents is before the cost of managing securities.

Again, the wearing out of materials was ignored, to say nothing of the expense of operations.

Jack Hudson

Waco, Texas

ACM Minneapolis

"The best committee I ever worked with," said one happy official. "They came up to me and *asked* to be helpful," said another. It wasn't all peaches and cream, but the recent annual meeting of the Association for Computing Machinery certainly was one of the best organized in the decade. And the second largest – only the Silver Anniversary in New York, 'way back when only a few of us distrusted the FBI, was larger.

If you came early, you soon discovered that the sidewalks (and the sidewalk cafes) had been rolled up quite early Saturday night and would not be unfurled any time Sunday. Shrewd visitors went Greek dancing far out beyond the brewery, but the committee wasn't much help on *that* one! SIGElbow, devoted to relatively sober socializing, filled the gap for the innocent.

There was a plethora of panels and a relative scarcity of refereed papers. I was too busy on committees and boards to check out many sessions, but noted that the panels on software agonies of various sorts were well and fervently attended, while the social-significance stuff did poorly. This, in spite of very heavy student registration. The citizenry and the economy can go blithely off down the road to EFTS and monopoly and general helplessness, for all most ACMers seemed to care – but the mid-1975 definition of structured programming and the latest greedy claims of the microprocessor clan played to packed houses.

Ah well, 'twas ever thus in the computer trade. The chess matches were sellouts. IBM brought a 5100 to the student lounge and was absolutely inundated; the computer art was pretty good. The Association tries nowadays to have all its sessions and all its housing under one single roof. Naturally, since this was done in Minneapolis, the weather outside was scrumptious; it only rains or snows when attendees have to run back and forth between split locations!

The most exciting scene of the meeting was, paradoxically enough, after it closed. The Council met all day Thursday (Oct. 23) and debated for almost two hours a resolution supporting the Russian Valentin Turchin (pronounced terCHIN, I found out) in his struggles to emigrate. A healthy if somewhat variegated assortment of supporters prevailed very handsomely in the end; the Hardnoses and the Hardhearts were cut off at the pass. But it was done in reasonably good spirits, and the wounds were not too deep. Charges that Turchin was not really a computer scientist were refuted by inquiries organized by Dan McCracken; wranglings about who paid Turchin's dues were suppressed; the presiding officer's fears of the Internal Revenuers were ignored; we Bleeding Hearts triumphed. Word will go to the USSR and to that other Siberia, the State Department, that the ACM Council views with concern. I'm *very* glad.



Herb Grosch

Ignoring Problems Common in Data Base Selection

Did you know data base users can find themselves paying two or three times more for data processing than nondata base users?

That there is no way of safeguarding either the future efficiency or security of data base use?

That both the two hopes for the data base future – distributed and relational systems – have major and often ignored problem areas?

The Taylor Report
By
Alan Taylor, CDP



And, worse than all of this, did you realize that no effective escape hatch is currently available to data base users who want to get out from under whatever they are doing and move to a new data base system? In short, that data base users are by and large locked into the vendor they originally selected even when matters go wrong?

Data base salesmen will, of course, fight all of these contentions, but each of the examples above comes straight from the biggest-ever working conference of data base experts, held by the National Bureau of Standards and Association for Computing Machinery in Fort Lauderdale, Fla. a couple of weeks ago.

The fight data base salesmen will put up to prevent such real problems from being properly examined was marked as *the* user problem by Dan McGraw, Minnesota's assistant commissioner of administration, in the last moments of the conference.

"Overselling by ignoring problems" is occurring, McGraw claimed, adding users need more than anything else to know data base problems really do exist and are serious.

But neither McGraw nor anyone else at the conference denied data base systems have their uses. It appears, therefore, that what is needed is user awareness of the problems so they can evaluate them and decide which data base method is most suitable, perhaps on the basis of which has fewer problems, rather than which offers the most brownie points.

Escape Hatch Needs

The hopeful user who is ready to consider data bases, it appears, should work out the various times when and reasons why he might want to change data base system suppliers. No one I heard recommended that a user tie himself into a single supplier.

Changing hardware and technology are obvious, almost universal reasons for avoiding lock-in. After all, data base systems will need to continue once set up and users certainly can't be expected to remain with obsolete equipment. But there are also other reasons to look for an escape hatch.

For instance, if the hardware or software of the data base system fails to give the price/performance (as may well happen), the user may look for an escape hatch. But the forecast price/performance will always be related to expected usage of the data base system, anticipated growth, accuracy of original policy requirements, current legal conditions, etc.

Any of these factors can change almost overnight – and without anyone having necessarily goofed up. The sudden result may be an overloaded data base system or one that simply turns out not to be flexible enough to provide the information required.

Some data base methods are reasonably simple to set up, but very hard to change once set up. That is a serious enough problem that may well push a change of data base system suppliers.

A user should therefore be aware of the possibilities of change being wanted at several times:

- Before the system installation is completed (if installation costs rocket, for instance).
- Shortly after installation is completed (if use patterns, policy flexibility, etc., are inadequate, if security fails or if operational costs jump).
- When software technology permits order-of-magnitude improvement (within three or four years).
- When hardware technology permits order-of-magnitude improvement (also within three or four years).

All these are sufficiently certain so data base planning should have specific, prefinanced, contingency plans for each separate case. The way in which matters would be organized both for the original installation and the operation of the data base would take into account the need to keep the escape hatch open. Because it will be used sooner or later.

Another major area of data base systems in which real problems exist is the efficiency area. In ordinary batch work, we can work out the time and effort required to handle known volumes of work. But to do this we use known file structures and processing timings.

In on-line work, our ability to even control response time is hampered by the great increase in the amount of housekeeping per transaction. Our results have often been off by two or three times, even when we know the hardware and the system.

Effectively, this has cut the real capability of the system to one-third of its expected capability where response time has to be maintained, as often occurs. It can be cut even more drastically if, at the same time, the work volumes have increased, because overhead often increases quicker than the volume change.

Solving Efficiency Problems

But under on-line systems the user situation can be saved by reducing or even eliminating background processing, putting the on-line work into priority categories (and dropping some right out), etc. No such escapes from inefficiency are available with data base systems – at least not centralized ones. The whole idea is to keep everything under one roof – so there is nowhere to shed the load to!

Nor has the art of forecasting accurately beforehand improved since the on-line days. If anything, it has gone down. According to the advanced technology committee at Fort Lauderdale, forecasting can't be expected to come up again in the next five years!

Yet, as the audit committee said, there is still a need for justification before going into data bases. So what is a hopeful user to do? How can he justify without reliable forecasts?

As far as I can see, he simply has to accept the fact that the data base system will really have only one-third the apparent capacity. Or, alternatively, he must accept that he is gambling with the life blood of an organization (and without a good escape hatch). (I can also see data base system job-hopping becoming a serious problem if too many users elect to take the gamble – but there it is.)

Taking Gambles

A user justification that cannot plan for a system being fully loaded when apparently only one-third of the system used is – at the present – just a gamble taken in the face of prior failures. Users should also know this.

In addition, users should be aware of the situation with regard to data base controls. What has happened is that we have a vacuum situation. At Fort Lauderdale, it was accepted that inevitably the auditors (internal and external) would be dragged kicking, screaming and counting their fees into the data base control area, since no other group was available. But they simply are not there yet.

And there are distinct signs that when they do come, the auditors will insist upon some fundamental changes *before* they are prepared to exercise the controls. Fees won't be their only demand, you can be sure of that. Before they accept a control function, they will have to satisfy themselves that the system is controllable.

One auditor at Fort Lauderdale claimed such control is currently available – provided the auditor has full understanding of advanced communications, the latest implementations of operating systems and data base systems, etc. Others wanted the technologists to adapt the data base systems to a lesser degree of genius among their auditors by, for instance, having standard languages and excluding the data administrators from access to the data base.

Control Not a Reality

Thus it can be seen that data base control is still a long way away from being a present reality. Of course, your particular data base may not need controls very much. But then again it might.

The hopeful user will have confronted the control problem that currently exists – and won't even start working on the benefits of data base systematization until he knows (and everyone around him knows) the importance of understanding what the control problems are.

There are other problems also. Data base sizes, for example, can drastically impact user decisions. Comparative activity counts now being used are simply not comparable. Consideration of data base handling under system changes and reorganization are vital.

But these few will do to illustrate the real message from Fort Lauderdale – beware of overselling, because provable facts just can't be given. Not yet – and not for the next five years!

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by Glenn ImObersteg

Another 'Project Which Failed'

Technology Flounders When Timing Off

By Miles Benson
Special to Computerworld

This is the story of a project that met all of its design goals with flying colors – and still failed.

Papers were published on it, and both the industrial and academic worlds agreed it was well ahead of competitive projects in its field. But it still must be considered a failure.

Why?

The Sociology of Computing

Let me tell a little of the story before I answer that.

When Sally Turlock first arrived at Softli Paper Co., she thought it was the greatest place to work ever. Softli was quite happy to let her continue the line of research she had begun at Wisconsin Western Tech. (WWT).

WWT at that time was deep into computer-aided instruction (CAI), and Sally had built a pilot program there which showed a great deal of promise. Softli felt CAI could be useful in its in-house training program, which required a lot of individualized instruction, and a half-built CAI system was too good not to pick up and go with.

Sally set to work with heart and soul. She was well up on the CAI literature, knew the strengths and weaknesses of existing systems and sprinkled in some new ideas of her own which made her approach to CAI unique and worthwhile.

Other CAI systems made it easy to present lessons to students, once the lessons were built. Sally's had facilities for building lessons, as well.

This double-barreled approach gave promise of overcoming some of the major obstacles to CAI acceptance, especially the natural resistance of the educational community to new things and the enormous difficulty of constructing lessons in the new medium.

As Sally's CAI system emerged from the drawing board into code and from the coding pad into hands-on-the-remote-console checkout, Softli grew more and more excited. When you hire several thousand people a year, scattered throughout the year, and you need to give all of them a basic training course and some of them special follow-ons, you have a training problem that doesn't fit the standard fall-winter-spring drill of PS 111.

You can't save up people until you have enough to make it worthwhile to give a course without wasting a lot of people time. CAI seemed ideal for Softli's situation – so much so that it began thinking about marketing the system outside.

Made Big Splash

Sally's CAI system emerged from the checkout phase with a resounding and positive splash. At a quiet, in-company acceptance test, she made the terminals fairly dance with a sample lesson construction and simulated student session. She had built a minicompany-orientation lesson as a demo program, and Softli's supervision was wowed by seeing the corporate name spread in new ways across a CRT screen.

In fact, it went so well that Softli called in the press. Softli and CAI spread via the wire services clear across the country.

The corporate name on the CRT screen made business pages and education pages from Tallahassee to Tacoma. It seemed like a giant step forward for CAI. The technology had made major progress, and public and educator acceptance would be furthered by the publicity.

At least, that was the idea.

You may be waiting, as you read this, for the bottom line. I mean, with all the glory, where's the "Project Which Failed," right?

It's a little hard to see what's wrong with this picture. Especially if the technology is right, and the politics is right, and the timing is right.

Unless you've followed the history of CAI.

What's wrong with this picture, CAI fans, is that the *economics* are not right. You may be able to build lessons, and give lessons, and impress people, but you can't do it cheaply.

Terminals are expensive. Phone lines are expensive. Computer time is expensive. Lesson preparation is expensive.

Those expenses are coming down – Sally's well-thought-out design helped, especially with the latter – but they are still not competitive with traditional teaching methods. Except, perhaps in unusual special education situations.

We're getting a little ahead of the story. Softli didn't know all this yet. It wasn't until the company beefed up Sally's orientation program and put it on-line for a few months that the economic facts of life began seeping in.

And, given the amount of publicity it had received, it was several more months before Softli decided to pull the plug on CAI.

Sally, meanwhile, tumbled too fast from her ego pinnacle. What had been major glory turned to mundane failure, and her spirits plummeted with the project. About a year and a half after the press demo, an offer came to her from a nearby software house. She took it.

Normally, that would be the end of a "Project Which Failed" story. Programmer meets program. Programmer falls in love with program. Program fails, and programmer identifies with failure. A familiar pattern.

Tale Has Postscript

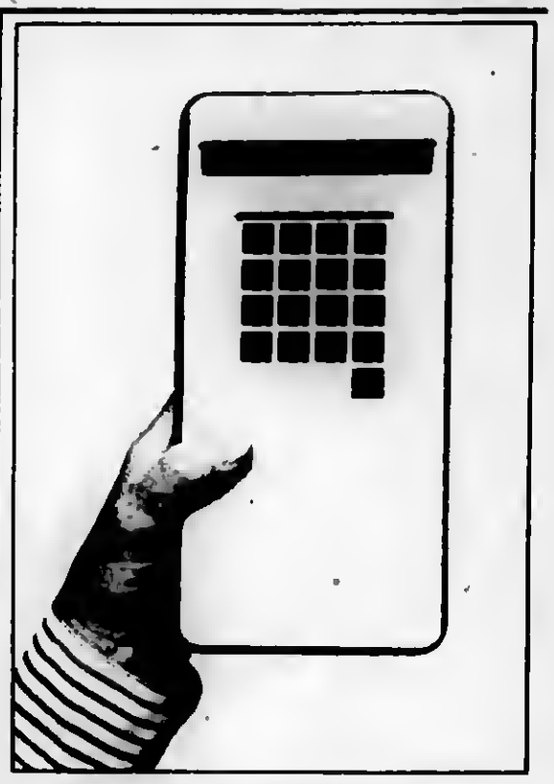
This story, though, has a postscript. CAI is, in a worldly sense, still out there. As computer costs go down, traditional educational costs go up and CAI technology beats down a few more barriers, the economic penalty is fading away.

A paper on Sally's system, trumpeting the return of CAI, was recently published by a couple of Softli employees. Softli still believes in Sally's system and would love to breathe life into it again. The paper spoke glowingly of her technology and drew some attractive cost vs. chronology graphs which made economic feasibility look to be only a couple of years away.

But even in the attempts to revitalize a "Project Which Failed," there was still a lingering taste of bitterness.

Sally's name was nowhere to be found in the article. When it came to fame, possession of the program appeared to be the proverbial 9/10ths of the law.





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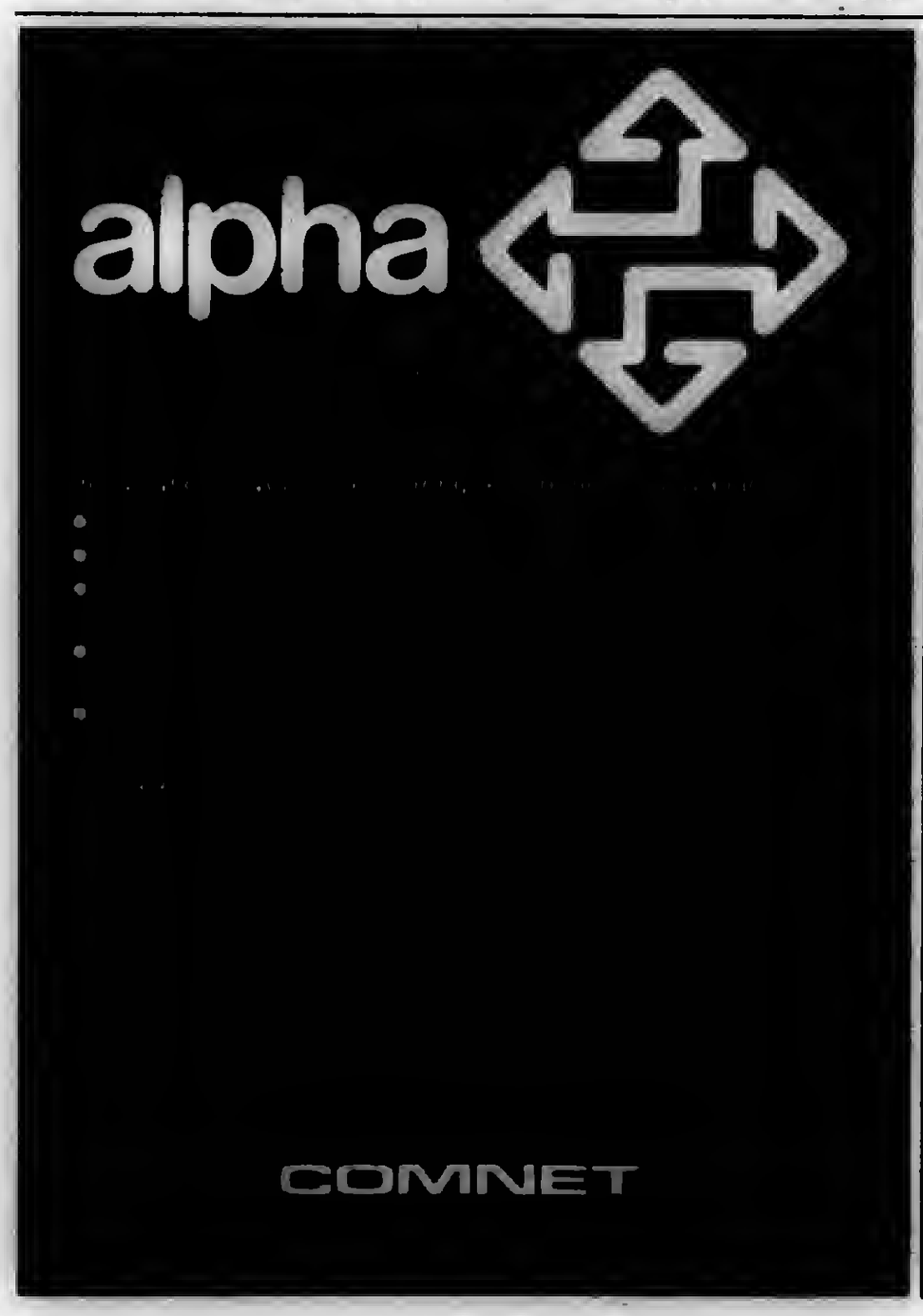
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Not Form But Substance the Issue at 4th and Main St.

By Gerald H. Larsen
Special to Computerworld

Once upon a time there was a comely young lady named Freeda-Roy. And she was young and very beautiful and heavily perfumed and carried out her profession on the corner of 4th and Main St.

One Friday evening, on his way home from work, Honest-John passed Freeda-Roy's corner and, having evaluated her obvious charms, decided a later train could be arranged.

Freeda-Roy and Honest-John dallied in a nearby dwelling, and Honest-John's enjoyment was great indeed.

Some four weeks later, Honest-John began to discover a certain faultiness and pain in the operation of certain parts of his anatomy. A visit to his friendly local doctor confirmed that Honest-John had acquired a substantial quantity of Neisseria Gonorrhoeae or, to wit, VD.

Enter the Law

Incensed at this inhumane assault upon his person and recognizing that its source was Freeda-Roy, Honest-John immediately called his lawyer (LC-John) and sued Freeda-Roy. Fortunately, Freeda-Roy had heard about lawyers and she, too, obtained counsel (LC-Freeda).

Both attorneys, being men of the bar and not given to acts of frivolity, entered the dispute with all of the seriousness, singleness of purpose and due regard for accumulated billing hours as is their customary wont to do.

Many depositions and investigations later, they discovered the crux of the lawsuit centered about whether the transaction between Freeda-Roy and Honest-John was one for "services" or "goods."

LC-Freeda reasonably maintained Honest-John had no grounds for suit – the transaction was clearly one for services and, since Freeda-Roy had acted with care and diligence, no further liability could be attributed to her.

Reader Commentary

LC-John, on the other hand, held a completely different view. The transaction, he maintained, was not one for "services," but one for "goods," tangible goods, real personal property, etc.

He did not deny that services were involved in the transaction, but, in fact, the transaction was one in which goods such as lipstick stains, perfume and, in this particular case, a rather large quantity of bacillus were exchanged between the two parties.

LC-John contended that, since this was a transaction for goods, Freeda-Roy was liable for any damage which might be caused as a result of the transaction.

A trial date was set in keeping with the importance of this matter and the amount of debate which would be required to settle it. This date was approximately four years in the future.

During that time many meetings were held between LC-Freeda and LC-John in an attempt to resolve their dispute. "Services!" cried LC-Freeda. "Goods!" cried LC-John. So the argument continued.

And the billing hours grew very great, and the pocketbooks of Freeda-Roy and Honest-John grew very small. And they grew sore afraid. It was now over two years since Freeda-Roy and Honest-John had even spoken to one another, their respective legal entanglements having been left completely in the hands of their attorneys.

They Meet Again

One Friday, as Honest-John was on his way home, he passed the corner of 4th and Main St. where Freeda-Roy was working the world.

"Hi there, Freeda baby," Honest-John said as he passed the corner.

"Well, if it isn't Honest-John – its been a lot of time, honey. You got any idea what's happening in our lawsuit?"

"No, hut I keep getting lawyer bills regularly. Tell me, Freeda-Roy, do you think our little adventure was a transaction for goods or was it a transaction of services?"

"Well, Honest-John, let me ask you this – was it good the first time?"

"Yes."

"Was it good the second time?"

"Yes."

"Then I guess it was a transaction of goods!"

"On the other hand, Freeda-Roy, when we met that Friday evening I told you I was looking to be serviced, and you said you had the finest services in the world."

"Services, schmervices, honey, I call it LOVE."

A knowing smile passed between Freeda-Roy and Honest-John. It was going to be another late Friday night.

Moral of the Story

The morals:

- Good services are usually less taxing than serviced goods.
- The form of an argument is usually the substance of some debate.
- Forms and debates make lawyers wealthy, but substance is that from which stars are made.

The postscripts:

- It is reasonable in an "opinion piece" for an author to use some license in language in an effort to be communicative. Such license hardly seems appropriate in a tutorial.

Roy N. Freed's use of the words "software program" in the article, "Definition of 'Software Program' Can Vary" [CW, Oct. 15] is extremely strange and not in keeping with any known form of usage in our industry. The terms "software" or "program" or "computer program" or "computer software" are all potentially appropriate symbols for that to which Freed refers.

- Freed refers to terms used in our industry as "jargon" rather than as "terminology." Unfortunately, the word jargon carries a strongly negative connotation not at all in keeping with the diligence with which we pursue definitional precision in almost every instance.

Simply because people outside the computer field do not always understand our terminology does not change that terminology into jargon. Res ipsa loquitur.

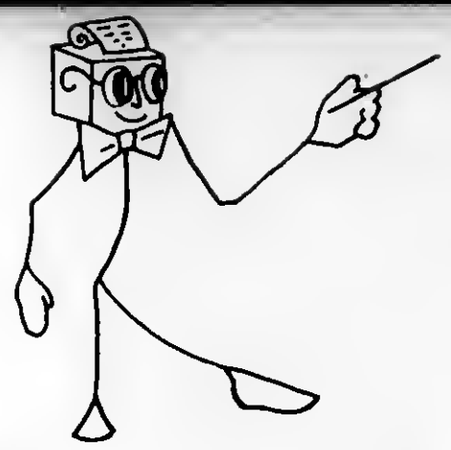
- The "IBM License Agreement for IBM Program Products" [Z120-2065-2 (U/M-025)] is an extremely well-written agreement which at no time confuses a program product with the media on which that program product is stored – as claimed by Freed. Read the agreement for yourself. Magnetic tapes aren't programs – but you gotta know that terminology!
- The discussion in Freed's article concerning whether software is "goods" or "services" speaks clearly for an immense sadness which covers our entire nation.

To the extent that we waste time and energy in arguments of form rather than substance, we contribute nothing to the universe. Instead, we devote ourselves to "getting around the law" rather than making the law into something of quality and substance.

Something of principle. Perhaps if we can return to substance rather than form we can once again see those things outside ourselves which are the reason for us – and computers.

Larsen is president of Unicorn Systems Co. in Los Angeles.

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'We've Agreed to Disagree'

Initial Study Group on DBMS Standard Hits Impasse

By Don Leavitt
Of the CW Staff

NEW YORK – The three-year-old study group on data base management systems (DBMS) standardization has reached "something of an impasse" and has turned to its sponsoring organization for help, according to study group Chairman Thomas Steele of Equitable Life Insurance Co.

Organized by the Standards Planning and Requirements Committee (Sparç) of American National Standards Institute's X3 technical committee, Steele's group was to determine the economic and technical feasibility of a DBMS standardization effort.

If the group gave standardization a green light, it was also to define precisely what it saw as a basis for standardization.

As part of its work, the group has studied numerous documents and proposals on data base, including the volumes published by the Codasyl Data Base Task Group in the early 1970s and these put out by Guide and Share, the IBM user groups.

The study group put out an interim report early this year outlining what it saw as the total DBMS environment, including a generalized schematic diagram of the architecture of a data base system and identifying some 40 interfaces with areas outside the DBMS itself.

Within that framework, the group has been attempting to write specific proposals on the DBMS and on the interfaces so Sparc could do its evaluation and make its recommendation to X3.

Unanimous Recommendations

The impasse has arisen, Steele explained, because "from Day One" the group made a commitment that it would not make a recommendation to anyone unless it was unanimous. "We have come pretty damn close to making a set of unanimous recommendations," he said. "There are only one or two things that separate the group."

Rather than fighting within the group, the members "have agreed to disagree" and reported to Sparc at a meeting last week that "it's probably appropriate to look for new blood," Steele said.

He feels that "to some extent" there ought to be a reconstitution of the study group to bring in "new faces, perhaps a new approach."

But that should not be a total rebuilding of all the current group has done, Steele emphasized. It should not be a new technical approach to the problem, but "just a willingness to start arguing all over again."

'Hung Up' on Codasyl DML

Specifically, he said, the group – despite its unanimity on much of what it wants to tell Sparc – is "hung up" on several points with respect to the Codasyl data manipulation language (DML) specification.

Some group members felt changes had to be made for these specifications to be acceptable candidates for standardization, Steele said. "Others felt the proposed changes were unacceptable" and, if included in the group's recommendation, they would make it unacceptable.

"So, we couldn't come to closure on that issue, and that's what we're taking to Sparc; just one or two things," he stressed, adding "It's not a matter of the committee being split down the middle" in the bulk of its recommendations.

How soon Sparc may act to break the impasse is unclear at this time. Typically that committee, which organizes and monitors the activities of various ad hoc study groups, hears a case at one meeting and "thinks on it" till the next meeting.

Steele said he expects "whatever [Sparc] decides to do will be deferred till

(Continued on Page 20)

Data Basics

Sycor Routine Adds to TAL II

ANN ARBOR, Mich. – The disk-based program library for Sycor, Inc.'s distributed processing systems has been extended to include a search-edit capability, according to a company spokesman.

The utility was designed to facilitate editing and maintenance of data files and is said to be particularly useful for Terminal Application Language (TAL II) source programs during program development.

The search-edit facility can copy or delete subsets of input files, insert records during file copy operations or locate and replace specified data within specified sets of records.

It can also list input files to provide record numbers in preparation for editor commands, Sycor said.

TAL II allows local inquiry/response and data entry on the company's remote batch terminal systems. It supports arithmetic operations, data movement, logical comparisons, table lookup, field justification and other basic DP functions.

The search-edit facility complements the system's backing of eight different sequential, random or indexed files or devices.

Used on the Sycor Model 340 with flexible disk option, the Model 350 or the Sycor 440, the complete library, including TAL II and the search-edit feature, is available on diskette for $35 from Sycor at 100 Phoenix Drive, 48014.

In Four DP Areas

'Assist' Aids Large IBM Users

SAN FRANCISCO – Assist from Advanced Software Techniques (AST) is described as an operational environment enhancement for large-scale IBM 360/370 users which provides support in four major areas: operational efficiency; real-time system problem resolution; system efficiency; and critical resource monitoring.

The package provides functions not available through OS, VS, Hasp or ASP and the support can be used under TSO as well as in batch mode operations, the vendor said.

Assist services provide "an efficient way of dealing with day-to-day operational procedures" including disk, tape and data set mangement and control of the jobstream during shift turnover.

Other operator supports include display of outstanding console messages, of CPU activity and of the 10 most active jobs.

Assist supplements existing operating system commands and allows users to work on problems that "cannot be addressed" otherwise. These problems include enqueuing conflicts, direct access reserves, jobs "hung" in execution, jobs or the system in a loop or running slow and problems related to missing or outstanding I/O operations, AST explained.

For the system programmer, Assist provides formatted display and permits modification of main memory without stopping the system, provides formatted control block displays and allows operator commands from a TSO workstation.

System efficiency of VS operations is encouraged, the vendor said, through displays of paging rate over the last recording interval, number of pages available and relative paging activity to the primary and the secondary paging devices.

Assist also shows job-queue utilization and provides for deadline management by allowing internal dispatching priorities to be changed by operations.

Other displays show free core and fragmentation within a region or partition and jobs "hung" in allocation or waiting for memory, AST added.

Assist runs as a problem program in 12K of memory. Written in Assembler, its internal logic determines whether it is under MFT, MVT, VS1, VS2, Hasp or ASP and adapts its processing.

The package can be leased for $125/mo from AST through P.O. Box 7729, 94119.

'Model 204' Gains Math Option

CAMBRIDGE, Mass. – The Model 204 data base management system (DBMS) from Computer Corp. of America (CCA) can be extended with the separately priced Fund package designed to make a number of mathematical functions available to the Model 204 user language, according to CCA.

The DBMS itself has been available for several years as support for IBM OS and OS/VS users. It is said to provide a complete set of facilities for the management of on-line bases.

The general-purpose user language backs the operation of remote terminals for high-speed data retrievals, report generation, data base maintenance, computations, conditional processing and data cross-referencing.

Response times are "orders of magnitude" faster than with sequential-access methods, the vendor claimed.

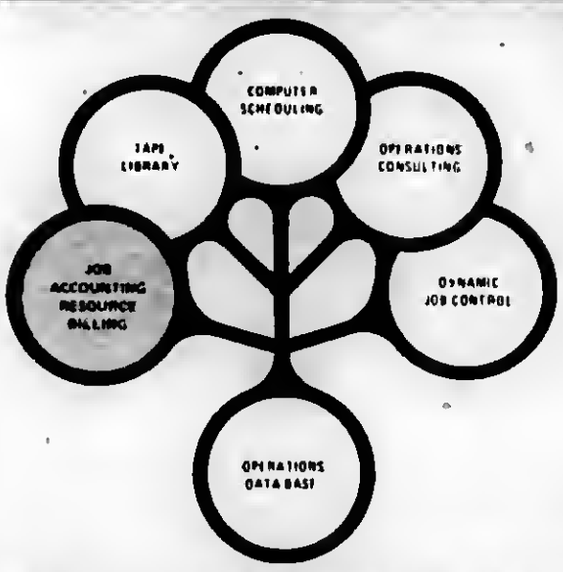
Fund enables the user to now perform such operations as square root, exponentiation, logarithmic and trigonometric functions, hyperbolic functions and calculations of absolute values, CCA said.

This option validates arguments and calls floating-point subroutines. In some cases, the mathematical routines are included as part of Fund; in other cases, the appropriate routines from IBM's Fortran mathematical library are used. Copies of that library are not distributed by CCA, a spokesman noted.

Model 204 requires a minimum 80K of memory and is written in BAL. Fund, also in Assembler language, runs with Release 3.16B of Model 204, and is not available with previous releases.

Built of four basic modules, the complete Model 204 is available under a one-time perpetual lease for $83,200 or for $2,800/mo for three years. The Fund package is an additional $2,400.

CCA is at 575 Technology Sq., 02139.



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Common Solutions Appear for Very Large Data Bases

By Harold Schwenk
Special to Computerworld

Very lerge data bases (VLDB) – on the order of a trillion or more bits – are appearing in ever-increesing numbers both in government end industry. Their problems are being discovered and solved independently by many organizations and, es one might expect, common approaches are sterting to appear.

The size of these VLDB corresponds to roughly 1,000 lerge-capacity disk packs or the larger mass storage subsystems available from many vendors in various technologies and architectures.

VLDB open up a whole host of problems which either do not arise in small dete bases or appear in a form which makes their solution relatively easy. The problems are due to both the vastly increased size of a VLDB and to the structural aspects of data bases as opposed to conventional files.

They erise in nearly every aspect of processing with VLDB: maintenance of information and structural integrity, physical and logical reorganization, online access, performance analysis and prediction, recovery operations, loading/unloading approaches, administration and application development methodology.

The dumping of a VLDB provides a clear example of the type of problem magnification which can occur when working with VLDB if conventional approaches are simply extended.

Data Basics

Take, for example, a data base of 100M bytes. We might expect a structured dump of the data base can be performed in roughly one half hour by en intelligent utility. Also, we might expect the dump procedure eborts for various reasons and needs to be restarted perhaps one in a hundred times.

What happens if we use the same utility to dump a VLDB of 100G bytes? First of ell, we would need roughly 500 hours to perform the structured dump. Secondly, the probability of completing the dump without an abort has decreased to only .00004, which means we would have to redo the dump about 25,000 times on the average.

Obviously, the structured dump has to be reexamined for the VLDB environment. A new approach needs to be found for achieving the goal which the structured dump accomplished for the much smeller data base.

Getting Around Problem

To get around that problem, a number of approaches have been used by different organizetions, typically reflecting the DP environment involved, since the constraints on the approach are greatly affected by the environment.

In generel, the solutions involve recognizing a method of partitioning the VLDB so each portion can be treated individually.

This further involves introducing constreints on conventional programming practice and a mechanism for enforcing the constraints so the effective isolation between portions is maintained. Where an organization has introduced a system development methodology, this provides the vehicle for introducing the appropriate constraints.

Some approaches to recovery are more advanced than the partitioned approach. These are often special-purpose solutions, however, which depend on specific, known properties of the application involved and which cannot easily be generalized. Thus they are not covered here.

As a result of this general approach of partitioned dumping, of course, the reloading process is likewise modified and requires a new conceptual level for coordinating the various portions of the VLDB. In general, the VLDB as such will never be reloaded in its entirety.

To effect recovery after a total system crash, we must determine which partitions may have been affected and to confine the recovery operation to as small a part of the data base as possible. In the

(Continued on Page 20)



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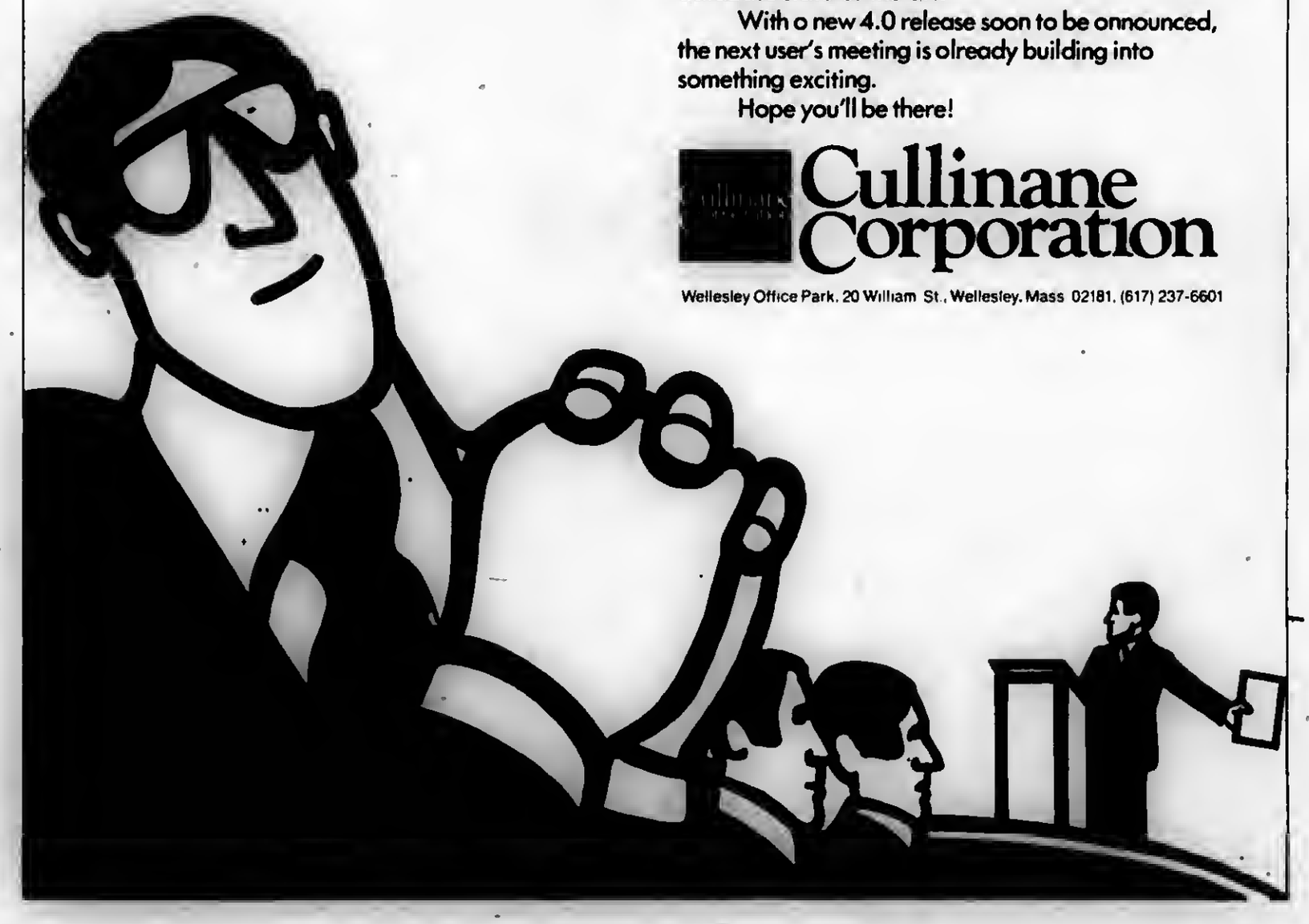
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Solutions Beginning to Emerge For Problems Native to VLDB

(Continued from Page 19)

VLDB environment, it becomes worthwhile (even neccssary) to develop more powerful recovery tools. Note that these recovery techniques are necessary, even in the relatively less complicated environment of single-thread batch usage.

In many ways, the recovery approaches which are used are similar to those which have been developed for present-day, on-line applications. They include the processing of journal files containing before or after (usually both) images of affected data base information for backing up or bringing forward data base portions and transaction streams in the on-line environment.

Related to the problem of data base recovery is that of maintaining data base integrity of information and logical structure. The data base logical structure is, after all, just another form of information which is visible to the users of the data base system.

In VLDB it is nearly certain some information in the data base is incorrect or will become so. Errors must be anticipated. This is due, again, to the tremendous quantity of information in the data base. The real problem then is to be able to detect and recover from the processing of erroneous information while minimizing the probability of requiring an extensive recovery process.

The approach commonly used is to include redundant information, especially for the situations which are expected to be error-prone. A simple example, in the case of following chains of pointers through a data base, is the inclusion of back-pointers, which are then retrieved and verified during processing to detect errors in either the pointer value or in the retrieval process.

Some VLDB systems have utilities to help purify the data base when integrity problems arise. The utility may make use of some knowledge of the logical structure of the data base to locate alternate paths to the desired information in the case where the attempted access path could not be successfully followed.

Other utilities are simply sets of tools by which a data base administrator may probe the data base and perform repairs according to his judgment.

Turning now to another subject, the issues in restructuring VLDB are quite difficult. Current approaches appear to be quite system specific, but some commonalities appear.

Commonalities Appear

The basis of these solutions is to find some mechanism for isolating small pieces of the data base so the entire data base can be processed by incremental reorganization. This can usually be done without too much difficulty for a physical reorganization of the data base.

A logical reorganization is much more difficult, since the logical structure of the data base, as seen by various users, must be preserved during the process. Techniques for accomplishing logical restructuring appear at present to be quite system and application specific.

Some other areas of interest for VLDB use are system performance analysis and prediction, data base administration, application development methodology and multithread data base processing (deadlock administration).

These subjects are, of course, of interest in regular-size data bases as well. The VLDB environment mainly emphasizes the necessity for their appropriate treatment because of the possibly very large consequences.

Schwenk is with Honeywell Information Systems and is a guest lecturer on data base systems at the Center for Research in Computing Technology at Harvard University. Readers' contributions on the subjects raised in this article will be appreciated.

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'Quikjob II' Enhanced

DAYTON, Ohio – Quikjob II, the load-and-go report writer and test data generator, has been enhanced to include a CALLing capability.

As many as five different subroutines may be used with one Quikjob III program, according to the vendor, System Support Software, Inc. (SSS).

The latest version is upward-compatible with Quikjob II, but includes 16 accumulators and an optional total-time processing cycle. Indexing features can be used to handle arrays and to perform "some" character string manipulations, SSS noted.

Quikjob III can be acquired for $4,950 on a permanent lease or for $125/mo from the vendor at 28 East Rahn Road, 45429.

DBMS Standard Work at Impasse

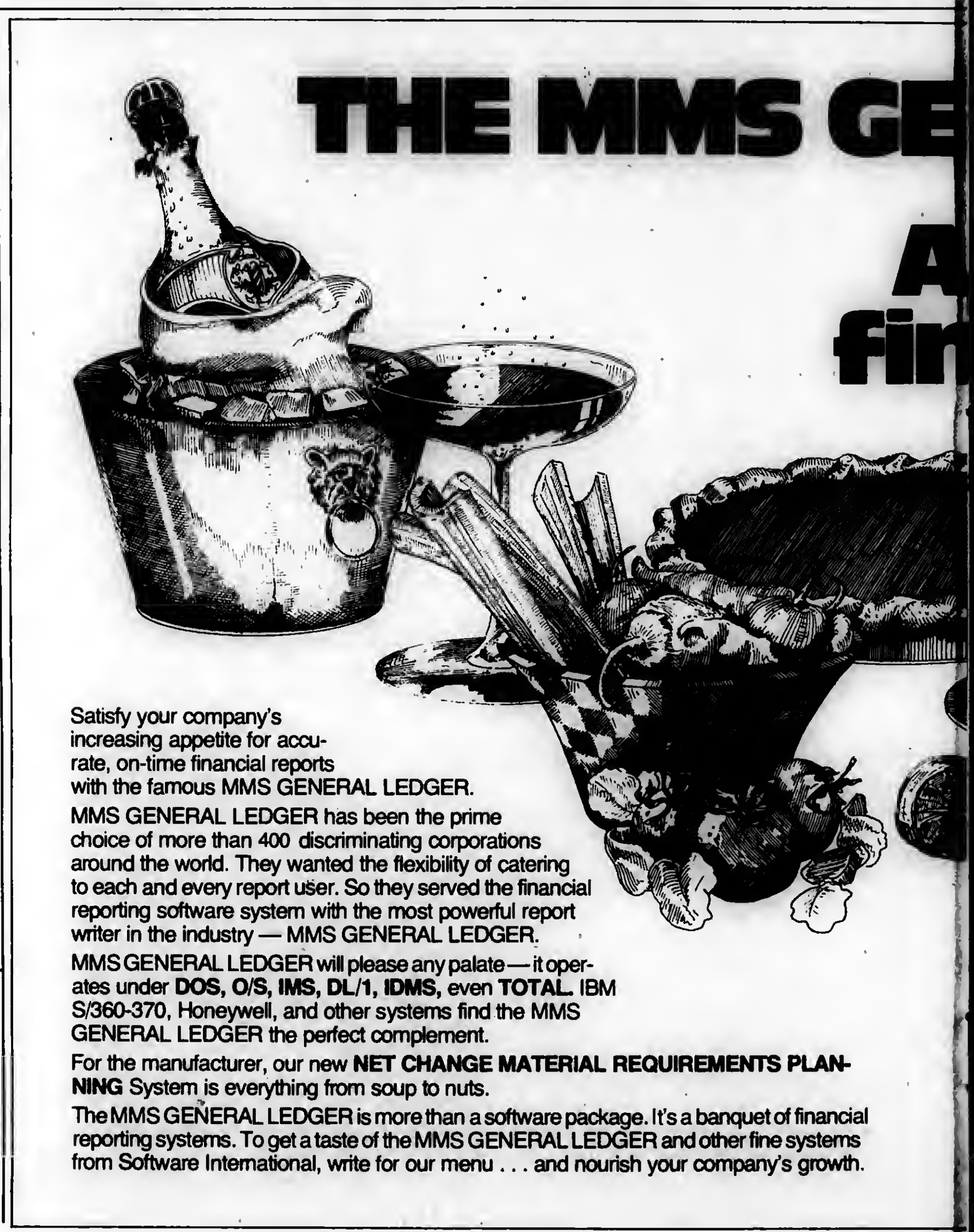
(Continued from Page 17)

about January."

In any situation like this, Sparc has three options, according to its chairman, William Madison of Harvard Business School. It can "kill" the project, ask the study group to continue its efforts (with or without any suggested redirection) or go ahead on its own authority and make a recommendation to X3.

Commenting directly on DBMS – but before the meeting in which Steele gave his report – Madison said he "would hope Sparc could suggest a change in direction so the study group could keep working.

"It would be a damn shame to see its work cut short."



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Models Modernize Metalworking Managers' Milieu

By Barry F. Croasdale
Special to Computerworld

On the first working day of 1974, top management of Revere Copper & Brass, Inc. studied the corporate profit plan for the 12 months ahead.

As the figures (with input from 24 locations) were reviewed, the managers noticed certain potential fallacies. One in particular was major: The anticipated expense for oil in certain plans was significantly understated.

The figure was checked out and found to be understated. A new figure was developed, fed into the corporate planning model, and a revised profit plan quickly produced.

The new iteration, which reflected a much more realistic figure for oil costs and other changes, was run off with minimum effort because – for the first time – the profit plan was computer-produced.

Several other "firsts" were involved in the process. Our profit plan was ready the first day of the year, rather than at the end of February. And actual results could be tracked against the profit projections on a monthly basis rather than quarterly.

This activity helped us construct a computer-based cash flow model that, for the first time, projects ebbs and flows on a monthly basis. This model is particularly significant and vitally important to top management since continually escalating costs of energy, raw materials and capital make close, accurate tracking of cash flow essential.

Reduced Workloads

Using manually prepared plans in the past, profit and cash projections were developed only with difficulty and had limited utility. Now, under the facilities of IBM's Planning Systems Generator II (PSGII), we have converted them into computer models.

The result has been to significantly reduce the planning staff's workload, even as the plans themselves have been turned into much more effective management support.

Formalized financial planning at Revere began at the end of 1968. The Impetus for using a computer came from top management, and in 1971 we considered contracting with an outside service. However, we required the development of a model that would be responsive to our special needs.

PSGII accelerated the model development process since it allowed us to concentrate on the model itself, without devising special programs for data handling and organization.

Staff Training

The decision to proceed was made in 1973 and included a significant commitment to train our staff thoroughly in PSGII operations.

Three of us attended a course in PSGII. This created a close-knit modeling team with both financial planning and programming backgrounds and was instrumental in the orderly model development that ensued.

We began work on the first model when we completed the course. In less than two months it was completed – and the fallacies, uncovered through review, became a simple matter to correct.

The Consolidated Group Income Statement is produced each month as well as for the entire year. Examples of line items in the report are gross sales operation costs, gross operating margin, net operating margin, mill overhead costs, general overhead, profit before and after federal taxes and depreciation and depletion expenses.

The profit plan is used as input to the cash flow model, where the top line item is income before federal taxes. Factors such as depreciation and accrued interest expense are added to develop total estimated receipts from profits.

The bottom line shows the projected cash flow for each month and thc amount of increase or decrease. These trend projections have proved to be accurate.

Top Management Involved

Perhaps the single greatest benefit of the computerized models and their frequency is top management's increascd involvement in the individual steps of the planning cycle. More information is now coming from management, especially for the cash flow model.

PSGII enables us to organize decision-making reports in a format familiar to the top executive.

Closely rclated is the flexibility and speed we now have to play "what if." The corporate planning staff, for example, poses "what if" questions to division and plant staff members in developing data for the cash flow modcl.

Whcn management begins using this capability, the models respond very quickly with new iterations showing the projected results. In addition, communications among members of the financial planning committee are more uniform and more readily understood, since everyone uses the same definitions and language.

Costs have been significantly reduced, compared with manual model preparation. PSGII has a nominal monthly lease charge. We run it on our 370/135 under VS.

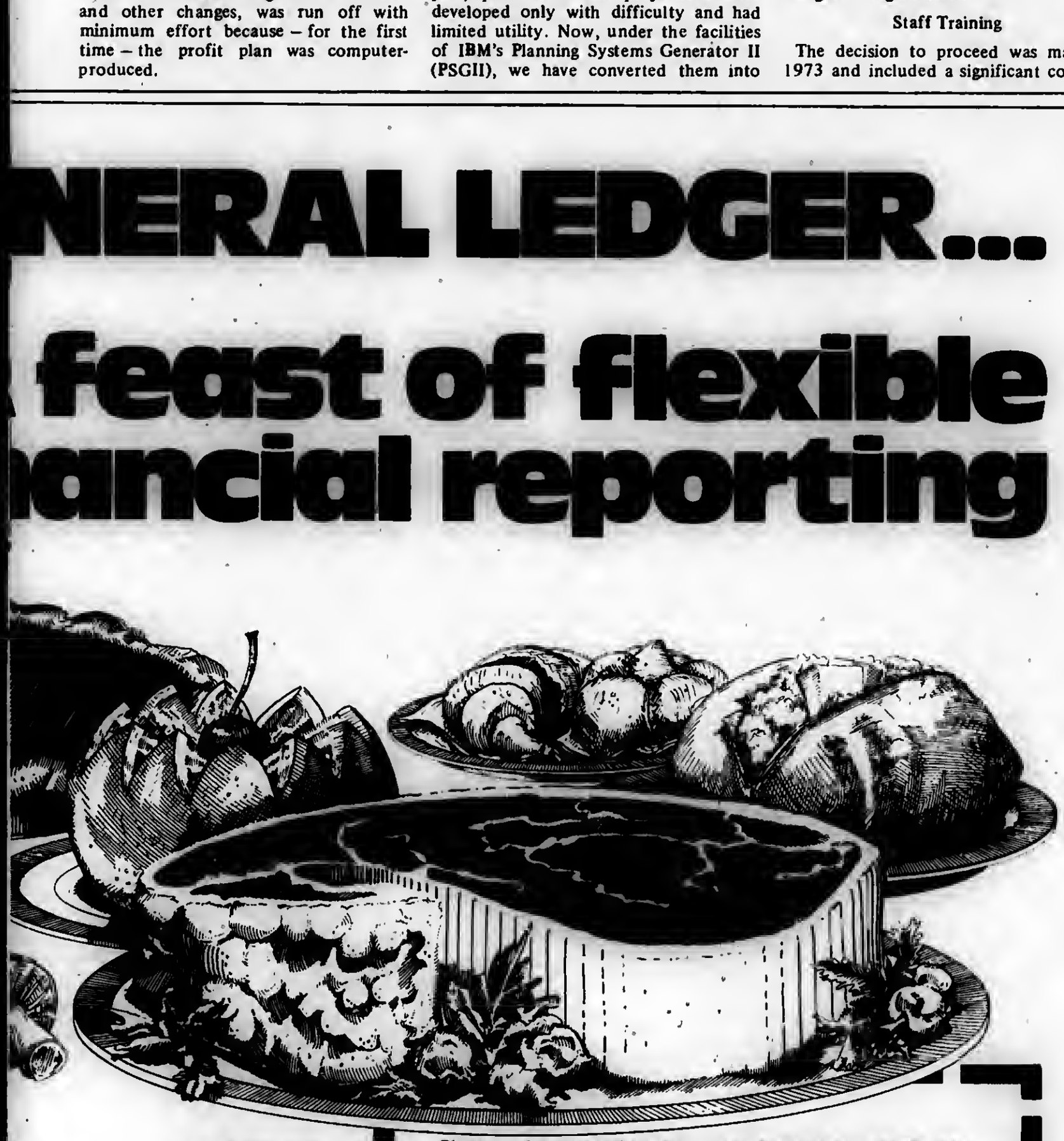
Finally, we have thc flexibility to build different models for almost any discrete activity, with formats tailored to cach purpose. While PSGII is supported by a set of functional macros or subroutines, we either wrote our own or tailored the existing ones to our special nceds.

We are continuing to retine the existing models and expcct soon to develop new models for capital budgeting, sales forccasting and to help balance the sales forecast against capacity planning.

We also expect, in the relatively near future, to use PSGII on-line.

Croasdale, is inanager of financial forecasting at Revere Copper & Brass, Inc. in Rome, N.Y.

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NCR Extends Manufacturers' Software

DAYTON, Ohio – NCR Corp. has added an optional on-line inquiry capability to its Bill of Material Application and Inventory Material Control Application systems for manufacturers.

The Manufacturing Systems Inquiry Module operates with NCR 796 CRT terminals linked to Century 101 or larger NCR CPUs, the company said.

The module provides access to the item master file and the product structure file created by the previously available application packages. It provides four basic displays: item information, master bill of material, "where used" and terminal status reports.

The item information display includes inventory status of the item as well as the last file update, cost factors and engineering changes associated with the item. The master bill of material display shows all lower-level components for an assembly or product by item number and description, NCR said.

'Where-Used' Display.

The "where-used" display reverses that view, and lists every structure or product in which any item the user specifies is used as a component.

The terminal status report is essentially for system control rather than support of end users. It shows the number and type of requests made during the day and the number of transmission errors encountered.

The on-line inquiry module will operate with a minimum 32K of memory. A basic Century 101 can support four terminals; with additional memory, 10 of the units can be used.

The software is available free to Century users, the spokesnam noted.

School Days

Public seminars on data base-related topics scheduled for December include:

Dec. 1-2 – **Data Base Concepts**; Washington, D.C.; $295; Institute for Science and Public Affairs (Ispa), 6003 Executive Blvd., Rockville, Md. 20852.

Dec. 1-2 – **Data Base Design**; Denver; $395; The Conference Co.. 797 Washington St., Newton, Mass. 02160.

Dec. 3-5 – **Data Base Structures and File Organizatlon**; Washington, D.C.; $395; Ispa.

Dec. 8-10 – **Structured Data Base Design**; Washington, D.C.; $450; Yourdon, Inc. (Yourdon), 1133 Avenue of the Americas, New York, 10036.

Dec. 8-12 – **Information Management System (IMS) Programming**: Houston; $450; Shell Oil Co., Information Systems Department; P.O. Box 20329, Houston, 77025.

Dec. 11-12 – **How to Be an Effective Data Base Administrator**; Washington, D.C.; $300; Yourdon.

Dec. 19 – **Data Base Management 1975**; Miami; $150; Yourdon.

Package Manages Budgets

HACKENSACK, N.J. – Control of capital budgeting, appropriation and construction-in-progress information is the design goal of the Programmed Appropriation Commitment Fixed-Asset Control System (Pac-Facs) from American Valuation Consultants, Inc. (AVC).

The package of six programs is said to provide reporting for all costs, capital and expense and time commitments – from authorization of an expenditure to the beginning of fixed-asset depreciation. It has been implemented on IBM 360/370 CPUs.

For both a total appropriation and for subprojects within the main one, Pac-Facs provides analyses of amounts budgeted, committed (through purchase orders or in-housc work orders) and spent. This system may be interfaced with a user's automated purchase order and accounts payables systems, AVC noted.

Detailed and summary data is available for treating closcd appropriations as construction in progress, the spokesman added. For ongoing projects, a hierarchy of record control extends from invoice receipt, to purchase order placement, to property unit control and finally up to appropriations control.

The system can be used in batch mode or on-line, is written in Cobol for an IBM 360/370 with 40K memory and at least three tape or disk files, as well as a card reader and line printer. The software can be acquired for $6,500 from AVC, Suite 303, One University Plaza, 07601.

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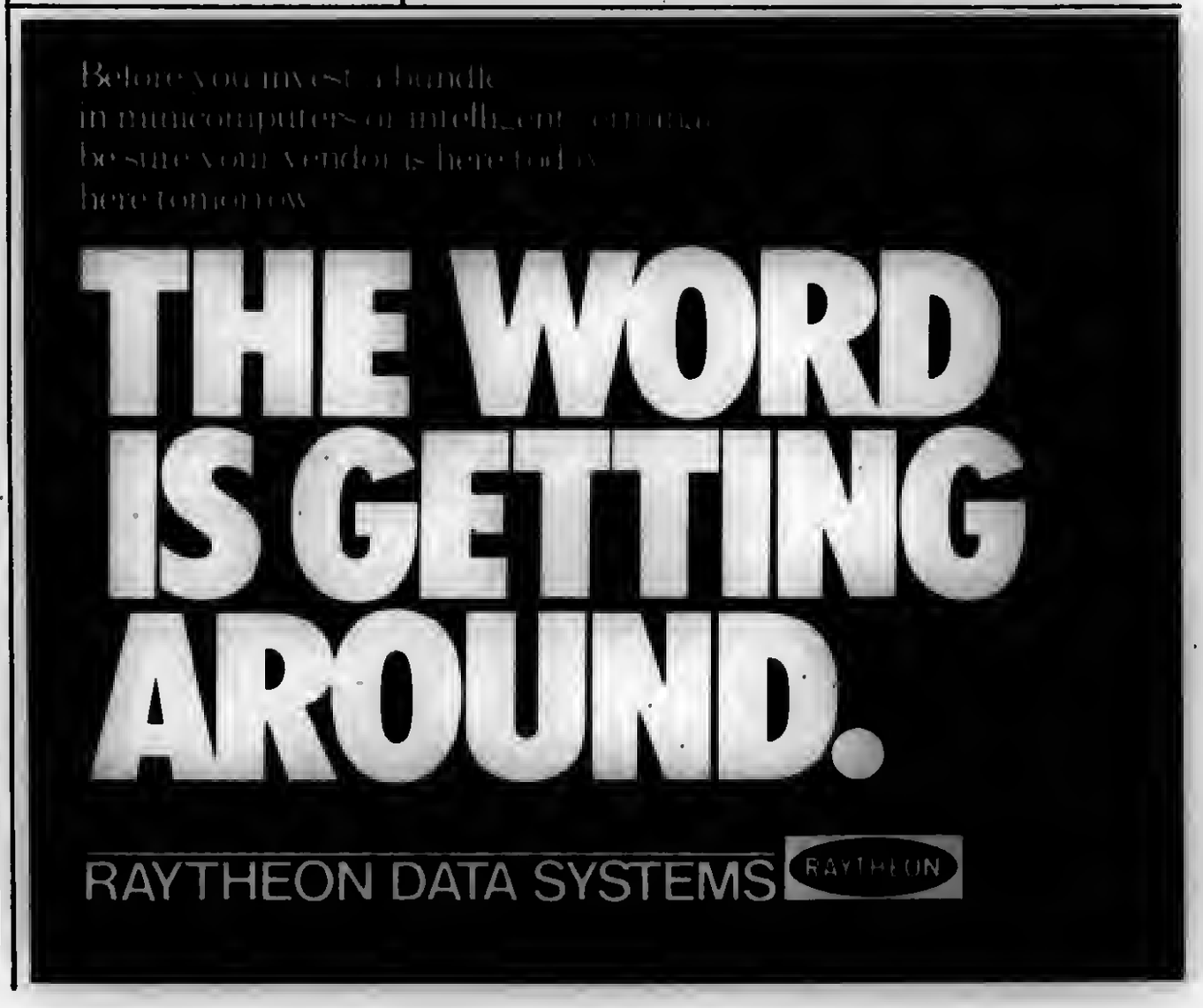
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IBM Upgrades 3705 Front End

By Ronald A. Frank
Of the CW Staff

WHITE PLAINS, N.Y. – IBM has upgraded its 3705 front end by adding monolithic memory, a faster communications scanner and support for 56 kbit/sec lines.

The version is called the 3705-II and it includes improvements to the Partitioned Emulation Program (PEP) mode which will allow the controller to simultaneously handle lines operating in 270X emulation as well as lines operating under the Network Control Program (NCP).

The earlier 3705 could handle only one PEP function at a time, an IBM spokesman said.

Both 360 mainframes operating with Binary Synchronous Communications (BSC) and 370 mainframes operating with Synchronous Data Link Control (SDLC) can be handled by the 3705-II.

The addition of dual channel adapters allows the 3705 to service two mainframes. The adapters can transfer data in blocks up to 32 characters compared with the current maximum of four characters in the earlier version.

The faster scanner uses a cycle-steal feature to stop the control program for one machine cycle when the buffer becomes overloaded. During this operation, data moves directly to and from storage bypassing the 3705's control unit. The faster scanner transfers data in blocks up to 254 characters. The 3705-II has a machine cycle time of one μsec compared with 1.2 μsec on the earlier version.

The 3705-II was described as being able to handle a larger number of high-speed lines than the earlier model. It can support 56 kbit/sec transmissions compared with a top speed of 50 kbit/sec for the 3705-I.

But IBM would not say how much additional high-speed line capacity this version has. The unit can "provide up to six times the number of high-speed lines available for the 3705-I," an IBM spokesman said.

But exact figures are dependent on amount of storage, message block length, line speed, the percentage I/O utilization of the communications line, the line discipline, the line mode and the division of lines between emulation and NCP in the PEP environment, he said.

All upgrades to the 3705 can be installed in the field, and any 3705 controller that contains the monolithic memory will be designated as a 3705-II, IBM said.

A typical small 3705-II including one 75 bit/sec line, three medium-speed lines (2,400 bit/sec to 9,600 bit/sec), emulation program and 32K of storage would cost about $1,426/mo on IBM's Extended Term Plan (ETP) of 24 months. A large system including 98 medium-speed 2,400 bit/sec lines, two 56 kbit/sec lines and 250K characters of storage would cost about $5,988/mo on ETP.

ETP prices for the 3705-II range from $1,400/mo to $6,000/mo compared with $1,400/mo to $8,400/mo for the 3705-I. Straight monthly rental ranges from $1,600/mo to $7,000/mo for the 3705-II compared with $1,600/mo to $9,800/mo on the earlier version. Purchase prices are $53,000 to $228,000 compared with $53,000 to $319,000 on the 3705-I. First deliveries are scheduled for the third quarter.

NP/80 Has Communications, Data Base Management

By Patrick Ward
Of the CW Staff

CUPERTINO, Calif. – Four-Phase Systems, Inc. has introduced a combination communications and data base management computer.

The NP/80 network processor is designed to help users geographically distribute their data bases in hierarchies that parallel the users' organizational structures, Four-Phase said.

The NP/80 is said to represent the first use of 16K-bit dynamic random-access memory (RAM) chips. The higher density chips offer both production economies and size advantages, according to Four-Phase.

The company, which builds the 16K chips itself, also offers static 4K RAM chips for smaller NP/80 memory configurations.

The 16-bit processor can offer up to 256K of Large-Scale Integration (LSI) memory and can support up to 270M bytes of disk storage, the vendor added.

Intended for use in large regional and district offices, the NP/80 allows each level of an organization to store frequently used data in local system files. Four-Phase IV/40 or IV/70 satellite processor/data entry system users can access local, regional or central files thorugh the NP/80 with automatic routing to where the data resides.

A typical configuration might include two 32-keystation IV/70 systems directly connected to the NP/80 through channel interfaces.

The NP/80 can concurrently support shared-file access and high-speed communications for separate applications programs on two IV/70s, a spokesman noted.

The systems can be programmed in Cobol to work interactively with the NP/80 data base for on-line updates and transaction processing, Four-Phase said.

The 64-keystations can also access the corporate DP center's data base at speeds up to 50 kbit/sec through the NP/80's wide-band communications capability. The NP/80 offers compatibility with current IBM line disciplines and will support IBM's Synchronous Data Link Control (SDLC), Four-Phase said.

The NP/80 also offers up to six 9,600 bit/sec multidropped lines for satellite processing in branch office systems further down the corporate hierarchy, Four-Phase said.

However, users could choose to keep unique data bases at the distributed sites and send only summaries to the central site, which would then inquire into the distributed data bases to get detail as needed.

Multiprogramming Executive

A resident multiprogramming executive provides the NP/80's network control and data management services, the spokesman said. The NP/80 is transparent to the user, who continues to do his application programming on the IV/40 or IV/70 satellite system.

Four-Phase provides two families of software for hierarchical network processing. The Data IV/70 family includes three parameter-driven packages for users who want data entry, retrieval and file management. The Network Transaction Processing (NTP) family is a Cobol-based group of six packages for the systems-oriented user who wants maximum flexibility and interactive access to both local and central files. Reports and documents can be generated at remote locations using Cobol, RPG, Sort, Assembler, DOS and an extensive selection of utilities.

Monthly Rental

Monthly rental for the NP/80 with 16K bytes of memory and communications support for three 9,600 bit/sec lines is $312 on a 42-month lease. A system with 16K bytes of memory, 60M bytes of disk storage and support for one 9,600 bit/sec line rents for $771 on a 42-month lease.

A system with 64K bytes of memory, 67M bytes of disk storage and support for three 9,600 bit/sec lines rents for $964 on a 42-month lease. And a system with 256K bytes of memory, 67M bytes of disk storage and support for one wide-band line with speeds to 59 kbit/sec and three 9,600 bit/sec lines rents for $1,419 on a 42-month lease.

All lease prices include a channel interface to a System IV/70, maintenance, software, systems engineering support and systems education services.

Initial deliveries of the NP/80 will be made during the first quarter from the firm at 19333 Vallco Parkway, 95014.

Tymshare Responds to Telenet Complaint

WASHINGTON, D.C. – Tymshare, Inc. has told the Federal Communications Commission (FCC) that its Tymnet network operates in compliance with the joint user provisions of the commission rules and that therefore it should not be a common carrier.

The Tymshare response came in answer to an informal complaint by Telenet Communications Corp. to the FCC. Telenet had alleged that the Tymnet operation is a separate communications service and that it should be regulated.

Both companies provide a similar packet-switched type service to users. And, according to the Tymshare response, as soon as Telenet began to provide service, "it attempted to drive from the market its only competitor." Telenet operates as a common carrier while Tymshare is nonregulated.

Tymshare said the questions raised by Telenet were the same ones now under consideration by the FCC in Docket 20097, its study of value-added carriers and services. It said the commission should complete its work in this proceeding since the issues raised by Telenet are those already under study.

"Telenet is using this [informal complaint] to eliminate all activities it views as affecting it in the marketplace," Tymshare said. A spokesman for the FCC staff said the Tymshare answer had been sent to Telenet and that the staff planned no further action on the complaint at this time.

A Telenet spokesman said the Tymshare response was being carefully studied to see what Telenet's next step would be. Meanwhile, the FCC staff is reportedly working on the draft of a final decision in the value-added proceeding. It is not known when the commission will vote on the issue.

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'Tics' Speeds Design of Systems Using NCR 796-301 Display Unit

DAYTON, Ohio – NCR has announced software designed to simplify and speed the development of on-line systems using the NCR 796-301 visual display terminal.

The 'software is called NCR Terminal Information Control System (Tics). It is said to be designed to overcome two of the most difficult problems in implementing on-line CRT systems: Design of CRT screen formats and interfacing to an on-line communications driver.

The software operates with an NCR Century 101 or larger processor with a minimum of 48K memory. It can support a maximum of 20 NCR 796-301 visual display terminals. The 496-301 is a pollable terminal which can transmit either a line or a full screen at a time.

The system includes two basic subsystems, the screen generator and the terminal manager. With the screen generator, the programmer fills out coding worksheets to define a CRT screen format. The data is input to the screen generator via punched cards. The system generates a printed report showing the screen formats as they will appear on the CRT screen, the company said.

In addition, the screen generator sets up an application work area disk file for use in the final on-line program and a communications disk file to store the actual screen formats.

The second subsystem, the terminal manager, controls and executes all communication functions for the application programmer. This module relieves the programmer of the need to know the detailed working characteristics of the on-line communications driver and how to interface the application program to it, NCR said.

Tics is available now, free of charge, to Century computer users.

Terminal Transactions

M-8 Educator Based On Microprocessor

OLATHE, Kan. – The M-8 Educator from Technical Communications, Inc. is a microprocessor-based communications terminal. The system provides all essential functions for program development with a 53-key solid-state (Hall effect) keyboard; 64-character by 31-line CRT display; 110 bit/sec Teletype-compatible serial I/O; 300- or 600 bit/sec TTL-compatible serial I/O; composite video output for use with optional remote monitor.

The microprocessor module includes debug/monitor with user-callable I/O subroutines; 2K random-access memory expandable to 32K; two 8-bit TTL-compatible output ports; two 8-bit TTL-compatible input ports; and parallel entry port for high-speed peripherals.

The optional features for this unit include: a firmware-resident assembler, a cassette tape storage module and a programmable read-only memory programmer. Delivery is said to be six to eight weeks at a price of $1,795.

The firm is at Box 306, 66061.

Voice Adapter Looks Like Princess Phone

BURLINGTON, Mass. – Intertel, Inc. has a voice adapter, designated VCA700, for alternate voice communication on four-wire data lines.

The unit, which is compatible with Intertel's 1,200 bit/sec, 2,400 bit/sec, 4,800 bit/sec and 9,600 bit/sec modems, has a molded plastic handset and base, similar to the Princess telephone used by the Bell System.

Intertel's voice adapter connects to an Intertel modem through a self-contained cable. No connections to the telephone lines are necessary. The modem and voice adapter take care of all switching, ringing, interrupts and signal summing.

A small speaker produces audible ringing signals, and, for areas where a ringing signal cannot be heard, an LED indicator lights to show that a ringing signal is present.

Price of the VCA700 is less than $375. Lease price for a three-year lease is approximately $12/mo. The firm is at 6 Vine Brook Park, 01803.

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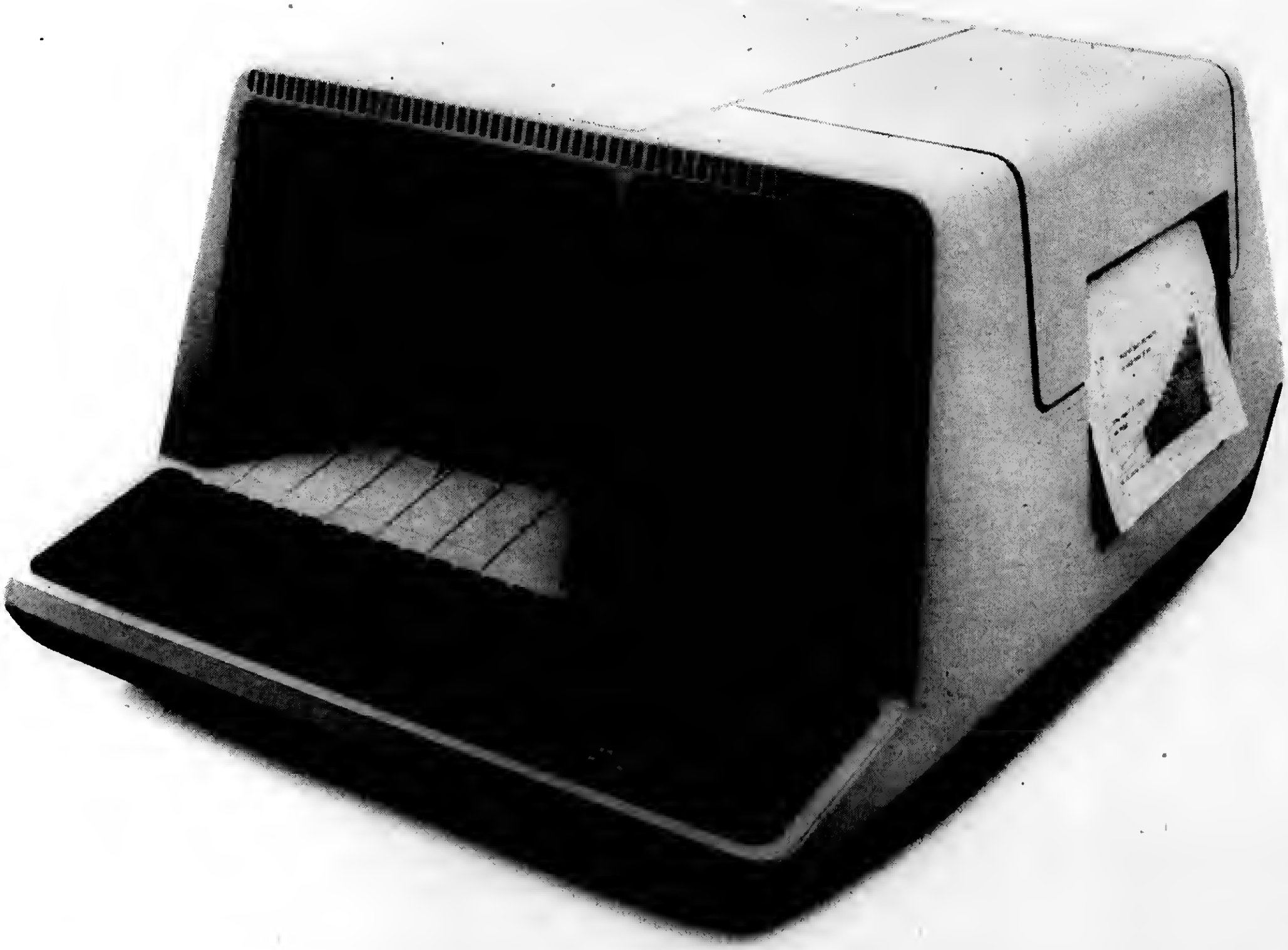
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Chemical Firm Uses Data Base to Monitor Rail Cars

By Hollis J. Sobers
Special to Computerworld

Five years ago Allied Chemical Corp. set up a computerized data base to monitor operations of its rail car fleet with the twin objectives of providing better service to its customers and achieving optimum productivity from its transportation resources.

The data base helps prevent loss of profits caused by inactive or underused equipment. Reports generated from the data base show where the 6,000 hopper and tank cars are located, their condition and their utilization.

Individual shipments can be expedited while management is given information to assist in improving the system's operations. Western Union provides the communication network used to continuously update the data base. Most Allied Chemical plants have Infocom terminals, a Western Union message-switching system.

Whenever a rail car is received, loaded or shipped, a notification message is sent out from the plant. This traffic is switched off-net by Infocom and sent via a TWX circuit to a Mitron MDRS-9 terminal in Allied Chemical's computer center at Morristown, N.J.

Plants which are not included in the Infocom net send direct to the MDRS-9 by TWX.

The MDRS-9 is an off-line communications terminal which reads and records computer-compatible magnetic tapes.

Performance Data

Intermixed with messages from the plants are car location report messages from the railroads that come to the MDRS-9 terminal at night. These reports locate rail cars by junction, city, time sighted and whether empty or loaded and include a car condition code. These messages provide Allied Chemical with performance data for the system.

Recording the incoming traffic onto magnetic tape for computer processing, the MDRS-9 helps by collecting it off-line and by eliminating paper-tape conversion or keyboarding from hard copy.

The system includes an MDRS-9 with automatic polling option which incorporates a timer to start the polling sequence. Connected to the TWX network by an 811B data auxilliary unit and 801C automatic calling unit, the MDRS-9 has a programmed memory to store TWX numbers and sign-on information. It dials and collects car location reports from railroads with on-line computerized data bases.

Messages originating at Allied Chemical plants or from railroads which come in via TWX are accepted by the MDRS-9 in autoanswer mode with the MDRS-9 providing answerback.

Some Canadian railroads, e.g., Canadian National, and a few domestic railroads utilizing Telex service transmit their data to a Telex machine at the Allied Chemical wire room. The Telex tapes are retransmitted to the MDRS-9 using the Telex-to-TWX service provided by Western Union.

At set intervals, the MDRS-9 switches into an automatic polling cycle to collect traffic from the railroad computers which require interrogation. During a polling cycle the MDRS-9 will appear busy to incoming calls.

The MDRS-9 equipped with autodialer and interval timer was built by Mitron Systems Corp.

Sobers is a senior consultant with Allied Chemical Corp.

Terminal Transactions

Hughes Aircraft Adds Display Unit

CARLSBAD, Calif. – An addition to the Conographic graphic display terminal line, offering high resolution, selective erase and built-in serial interface has been introduced by Hughes Aircraft Co. Industrial Products Division.

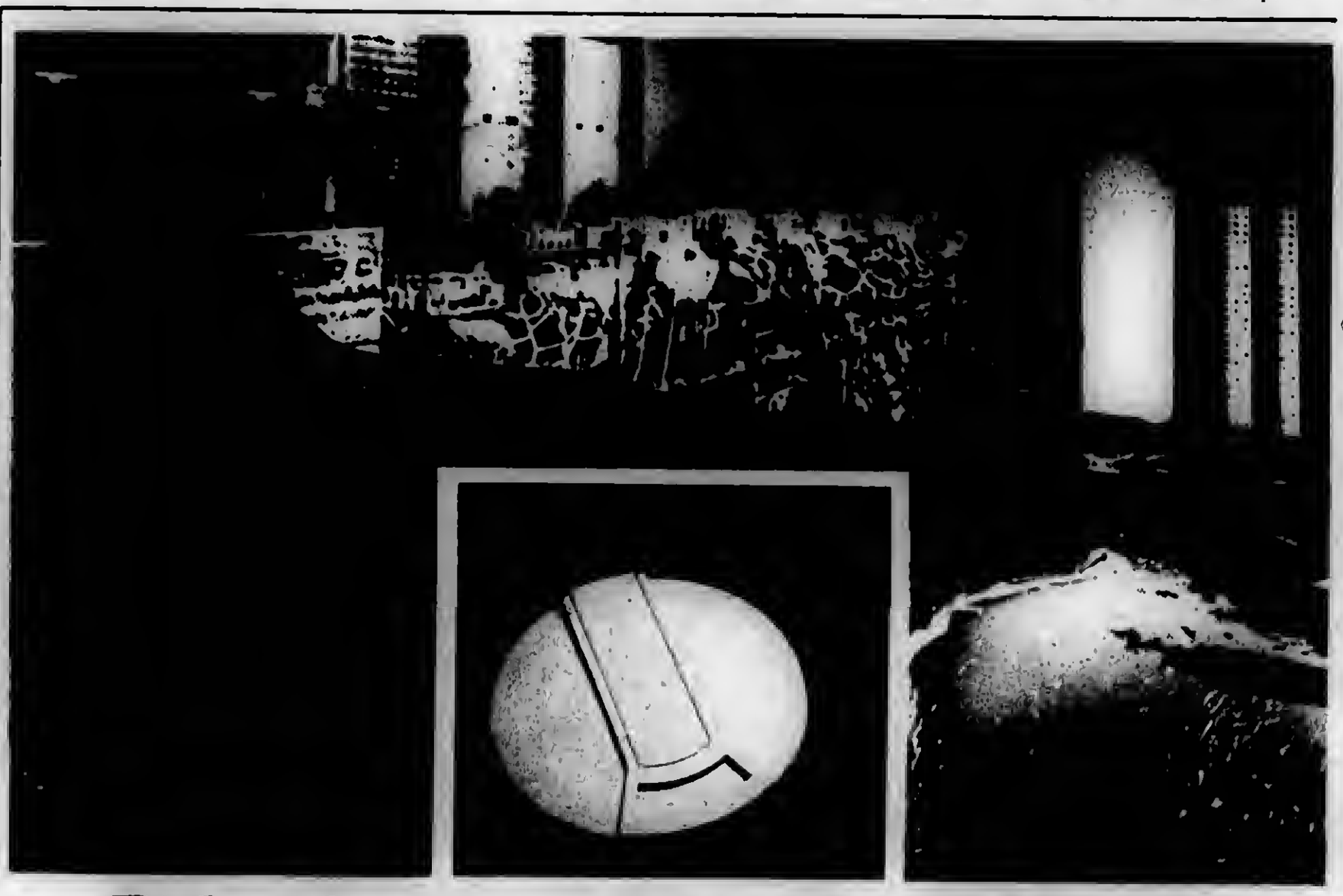
The fully interactive Conographic-9 terminal, with a base price of $9,750, is said to do with hardware what most terminals require to be done in software.

Standard features of the Conographic-9 terminal include 17-in. 1,029-line-scan video monitor with high screen light output, built-in zoom/pan, a joystick for graphics interaction and a hardware graphics processor for scaling graphics and alphanumerics.

In the Conographic process, curvilinear information is displayed by converting all contour data to conic curves. In this way, the terminal produces smoother curves than conventional x-y plotting and accomplishes this with considerable reduction in the data required.

This data reduction results in more cost-effective communication by permitting faster image transmission, higher effective telecommunications capacity and lower storage requirements at the host computer.

The display terminal is offered on 120-day delivery from 6855 El Camino Real, 92008.



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In Memorex Planner's View

IBM 3340 Introduced Generation of Disk Technology

By Patrick Ward
Of the CW Staff

SANTA CLARA, Calif. – IBM's 3340 data module drive introduced a generation of disk technology, in the view of a Memorex Corp. product planner.

The 3340 was the first example of IBM's Winchester disk technology, according to William H. Warren, director of product and business planning at Memorex.

"IBM didn't spend that much money for one product," he said.

The 3340 drive characteristics include a head with very low mass, which allows a lighter slider assembly and a lighter mechanical structure overall, he said.

The design should both reduce manufacturing costs and service calls, he said. Power consumption should go down and, since the head is riding close to the disk surface, it can record data at high densities, he said.

But, because that head is riding so close to the disk surface, it needs to operate in a very clean environment. Hence the head is enclosed within the data module, Warren said. While the product is economical to make, it requires careful manufacturing, he added.

"It's clearly the same technology appearing in IBM's terminals," he remarked.

The nonremovable disk files in the 3791 appear to be a one-platter Winchester product, he said. The System/32 had the same kind of enclosed disk, he added.

"IBM may be aiming at a common disk family, just packaging them differently," he remarked.

IBM is increasingly pushing the concepts of data base, data communications, teleprocessing and distributed processing, he said.

"All these applications rely on nonremovable, reliable disks," Warren remarked. Since most users still need some removable disk storage, IBM lets its larger users mix 3330s and 3350s on the same controller.

Small and mid-size shops can combine nonremovable 3344s and removable 3340s instead, Warren added. As users become more and more on-line-oriented, they can increasingly move to fixed disks.

"I don't think we've seen the last removable disk pack from IBM, however. There is a lot of technological room for growth, such as a double-density 3348," he said.

Is the Winchester technology to become a de facto standard for the industry? Engineers differ on whether there are current technologies that could supersede the Winchester line, Warren said.

The Winchester will probably stay around until the 1980s, Warren predicted. The data rate coming off disks is already about as fast as 370s can handle.

How will the independents fit into the Winchester scenario? They will probably offer "equal-for-less" products, plus some functionally different, but compatible devices that give the user more than just an equivalent product, Warren mentioned.

Optical Scanner Users Satisfied: Datapro

DELRAN, N.J. – Users of optical readers are reasonably well pleased with the performance of these devices, according to a Datapro Research Corp. survey.

The ratings assigned by 131 users to 175 optical character, mark and bar code readers yielded the following overall profile of user satisfaction:

	Excellent	Good	Fair	Poor
Overall performance	30%	54%	13%	3%
Ease of operation	34	50	14	2
Freedom from recognition errors	25	51	16	8
Freedom from document jams	30	44	15	11
Equipment reliability	29	42	18	11
Maintenance service	30	38	23	9

"Thus, while most users are well satisfied with the overall performance and the ease of operation of the current optical readers, they tend to feel there is room for considerable improvement in the areas of reliability and maintenance service," Datapro said.

Optical character recognition (OCR) scanning offers the notable advantage of automatic conversion of human-prepared data into machine-readable form, Datapro said. However, numerous obstacles have hindered acceptance of OCR scanning, the research firm said.

Costs a Stumbling Block

The direct equipment costs can dissuade many customers from trying the technique, Datapro said. But there are also hidden costs in "the comprehensive redesign of forms, adjustment of input-preparation procedures, personnel retraining and sometimes revamping of the DP system itself."

Difficulties in reading handprinting probably remain as the most serious technical liability of OCR scanning, Datapro said.

"Handprinting is being read now, but with an appreciable rejection rate and some substitutions (errors). Rejections require human intervention, and a high rejection rate can essentially neutralize the automation benefits of the scanner," Datapro said.

Beyond this, "key-to-disk systems . . . are currently more cost-effective in most data entry environments than optical scanning and have therefore begun to dominate the scene," Datapro said.

"This ascendancy is hardly surprising in view of the facilities offered- by the shared processors and supporting software" of key-to-disk systems, Datapro said.

All About Optical Readers includes individual user ratings earned by several popular optical scanner models, as well as specifications and prices of 101 commercially available readers from 41 vendors.

The 36-page report costs $10/copy from the firm at 1805 Underwood Blvd., 08075.

Conference Views COM's Rebirth

IPSWICH, Mass. – "The Rebirth of Computer-Output Microfilm" (COM) and its future impact on manufacturers and users will be the subject of a conference here Dec. 7-9 sponsored by the Institute for Graphic Communication, Inc. (IGC).

Sessions will include: Introduction to COM, Application Workshop, COM Equipment Architecture – Today and Tomorrow, COM Recorder Software – Key to Success, Designing a COM Installation: What the User Needs to Know or What the Vendor Won't Tell You.

Robert Laurent of McDonnell Douglas will chair the conference to be held at the IGC conference center here.

Further information is available from Richard D. Murray of the institute at 375 Commonwealth Ave., Boston, 02115.

STC Ups Tape Drive Prices; Maintenance Costs Also Rise

LOUISVILLE, Colo. – Storage Technology Corp. (STC) will increase prices for its Model 3400 tape subsystems (1,600 bit/in.) by about 4% as of Jan. 1.

The company will also boost maintenance charges for both its disk and tape drive products by 9% on the same date.

STC is at 2270 S. 88th St., 80027.

IBM Adds 3350 Backup Option, 3800 Burster/Trimmer/Stacker

WHITE PLAINS, N.Y. – IBM has made some hardware and software additions to its 3350 fixed-disk line, including a feature that can provide backup control for a string of 3350s.

The company also introduced an option that enables the high-speed 3800 printing subsystem to separate, trim and stack printed sheets in one continuous operation.

The recently announced C2 and C2F versions of the 3350 drive both have a backup control capability. (The C2F differs from the C2 in that it has 1.14M bytes of fixed-head storage/spindle.)

In normal operation, the two models function like the standard "B" 3350 drives on a string. If, however, the control circuitry in the "A" or lead drive goes down, the user can switch the control function to the "C" drive without calling a customer engineer, IBM said.

The 3350 Models C2 and C2F cost $1,500/mo and $1,860/mo respectively, under the company's Extended Term Plan (ETP) and $1,763/mo and $2,186/mo under the standard IBM rental agreement.

Purchase prices are $64,650 and $80,150. The adapter on the A drive that permits the backup operation is $10/mo on the ETP plan, $12/mo standard rental and $430 purchase.

The software products include Analysis Program-1, which allows the operator at the CPU console to test the operational status of the 3350 hardware and media.

IBM also announced enhancements to an existing OS/VS dump/restore utility that allow the user to dump or restore on the basis of just a data set or track, as well as on a volume basis. First deliveries of the 3350 products will be in the second quarter of next year.

The 3800 printer feature will be available in the fourth quarter of 1976.

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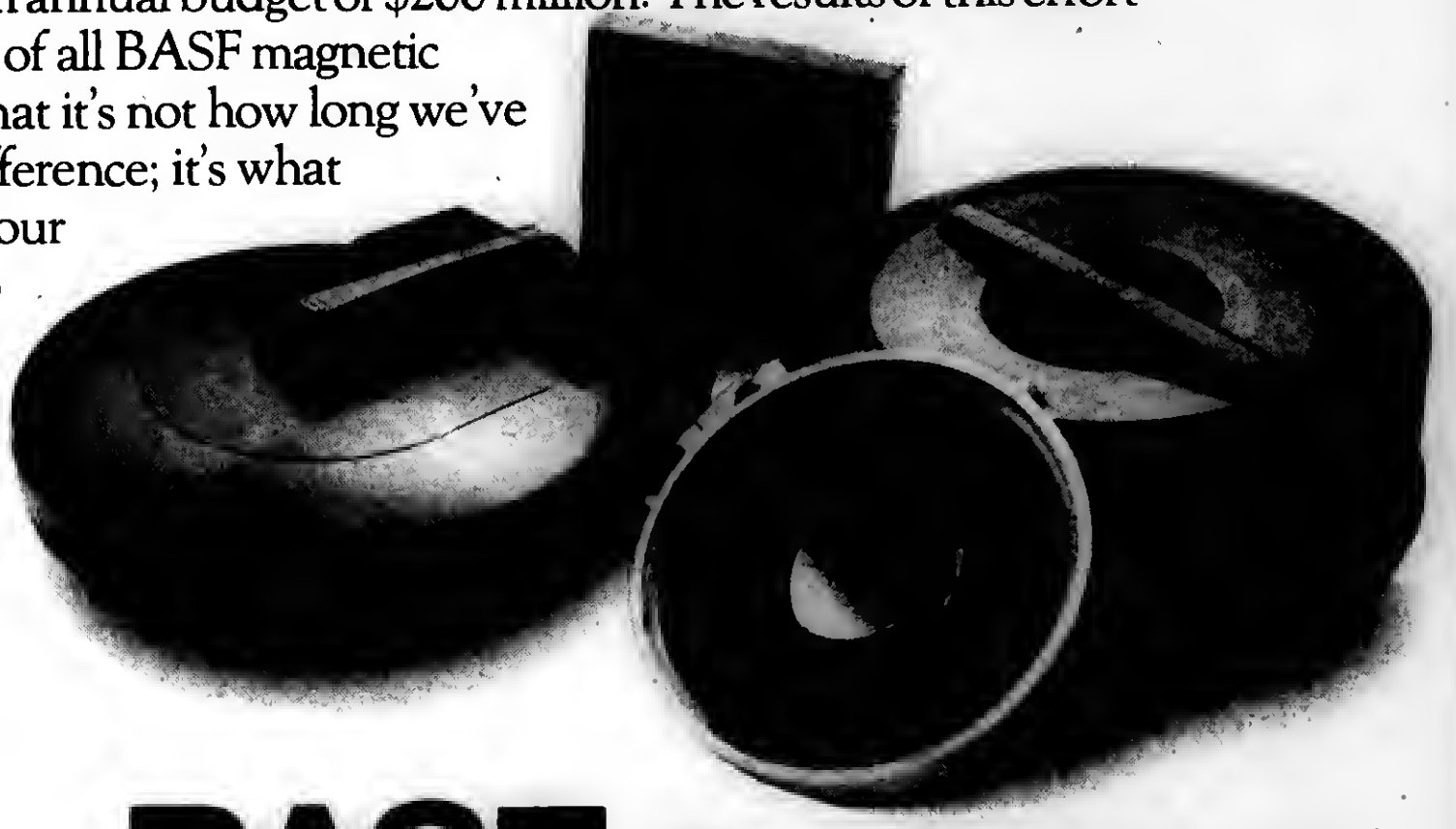
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CMC Product Planner Says

Reports on Momentum to Distributed DP Exaggerated

LOS ANGELES – Reports on the momentum of users toward distributed processing have been exaggerated, according to a product planner for a key-to-disk vendor here.

While he favors putting machine intelligence at the point of data entry to catch errors at the source, Peter F. Zinsli of Computer Machinery Corp. (CMC) said actual processing can best be done on the host mainframe.

"A lot of users have unrealistic expectations of what a local CPU can do for them," he said.

Users may complain about dealing with the central DP site, but the central DP shop can often justifiably place the blame on poor quality data from the users, he said.

Also counter to distributed data processing is the management information systems approach that requires all a corporation's files to be accessible to a central site, Zinsli said.

"Your real processing gets done where your files are," he said.

"It's very unlikely the user would want to put data in a remote file without the central site receiving the same data," Zinsli said. That leaves the distributed system user with the problem of justifying redundant files, he remarked.

Similarly, a satellite processor system needs systems analyst people to get it off the ground and then support people to keep it going, he said.

In recent years, corporations have gone just the other way, pulling 360/30s, 360/40s and the like out of their branch offices and putting in remote-job-entry terminals linked to a large central mainframe, Zinsli said.

Many key-to-disk users are still fresh from their keypunches, Zinsli said, and want extensive formatting capabilities, but don't want to make the effort to program the system to handle ordinary key-to-disk jobs.

Centralized key-entry operations are still the efficient data entry answer for many firms, Zinsli said. The fact that "your vendors won't send you all of your bills in one format.' is both an argument for centralized key entry and against optical character recognition (OCR), he said.

OCR Limited

While some have argued that OCR or a combination of OCR and key-to-disk will supplant key-to-disk, Zinsli feels scanning has too many limitations.

OCR cannot provide immediate feedback at the point where the user is entering faulty data, he said. And OCR users still have to choose between a high error rate and a low reject rate or the reverse, he said.

Zinsli did say, however, OCR is better suited to some applications, like turnaround documents, than is key-to-disk.

Bits & Pieces

NMA Proceedings Covering Years 1963-1974 Available

WASHINGTON, D.C. – The National Microfilm Association's (NMA) 1963-1974 proceedings, covering over 300 technical and application papers on computer-output microfilm (COM), are now available.

The 12 sets of proceedings comprise the largest collection of documents ever assembled on COM, the NMA said.

The proceedings are on 53 microfiche at a 24X reduction with 98 frames. Included in each set is a coordinate index with the entire group contained in a plastic fiche book.

The proceedings cost members $30 and nonmembers $45 from the NMA's publication sales department, 8728 Coleville Road, Silver Spring, Md. 20910.

Microfiche Reader Portable

MINNEAPOLIS – The NMI-75 from Northwest Mircrofilm, Inc. is a portable three-fourth-size microfiche reader that occupies 8-3/4 in. by 9-1/2 in. of desk space, the company said.

The device costs $189 from the company at 6840 Shingle Creek Parkway, 55430.

Firm Reinks Ribbons by Mail-Order

DOVER, N.H. – Yankee Computer Supply here will reink printer ribbons and return them to users on a mail-order basis, according to the firm.

A typical IBM 1403 printer user will accumulate 12 or more ribbons and ship them directly to Yankee which realigns, reconditions and reinks the ribbons at $5.75 each. Yankee then mails the ribbons back to the customer.

Most ribbons can be reinked two to four times without loss in print quality, the company said from Box 645, 03820.

CAM-I Seminar Planned

ST. LOUIS, Mo. – Computer-Aided Manufacturing-International, Inc. (CAM-I) will hold a two-day coding, classification and group technology seminar here in mid-January.

Fees are $25 for CAM-I members and $250 for nonmembers. Further information is available from C.H. Link, CAM-I's Executive Secretary and General Manager, at 611 Ryan Plaza Drive, Suite 1107, Arlington, Texas 76012.

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DP Manages Complex Manufacturing Environments

By John J. Donovan
Special to Computerworld

Control and efficient use of resources is the objective of manufacturing management. The complexity of managing these resources is reflected in the ever-changing manufacturing environment.

New product designs, products being phased in or out, processes for manufacturing being improved and volatile swings in economic activity have all led to management problems.

In recent years, computing equipment and concepts have been applied to the manufacturing function to provide assistance. Much of this activity has been in the traditional functions of forecasting/order entry, inventory control/management, order point, materials requirements planning (MRP), product structures/routings, master/production schedules.

It is obvious emphasis has been on the material resource. This stops short of serving the full manufacturing function, since total manufacturing resource management (MRM) looks at the proper utilization and control of all resources.

In order for manufacturing management to gain the full advantage of the computing resource, it must now extend its application to the other key resources of manpower and machines.

Since all of these resources interrelate, effective MRM requires integrated reporting systems to communicate manufacturing information.

Data created by various manufacturing functional groups must be recorded at the source, stored and be readily available to manufacturing management for appropriate decision-making requirements.

Data collection on information generated by shop operators, leadmen/foremen, material handlers, expeditors, timekeepers or other manufacturing personnel requires the application of appropriate computing equipment.

The selection of equipment should consider human and environmental factors in addition to data requirements.

Devices designed for the function are available from various vendors. Input media can include special badges and/or cards for fixed data while variable data can be entered by buttons, dials, switches, knobs or keyboards on special-purpose terminal devices.

Transactions can be tailored for specific systems needs and can include the ability to "step an operator through" a transaction. Edit checks can be made as data is created, increasing control.

Once manufacturing data is captured and recorded, data distribution can proceed on a timely basis to appropriate control points and management. Manufacturing management can be immediately informed of critical transactions via data transmission with output from various devices, or inquiry capability can be provided.

Integration should begin with pertinent order/forecast and inventory management systems. A subsequent requirement is the development of master/production schedules to use as a base for performance measurement. Another requirement is a detailed work-in-process inventory system to provide appropriate resource control of all product/material movement in the production areas.

Subsequent utilization systems then should be implemented to provide communication of production data on manpower/departmental performance, material movement and use and machine utilization.

Special-purpose data collection and data distribution hardware with proven support software is available now from a number of reliable manufacturers of computing equipment. This equipment has been designed for ease of use by shop operators for both clean and hostile environments found in the manufacturing industry.

How can this equipment be applied? Many firms have installed equipment to assist in managing manpower with attendance reporting and labor reporting/performance; materials with work order tracking, receiving/shipping and quality/inspection reporting; machines with machine utilization, monitoring, control and maintenance/repair.

The applications that use this equipment within the manufacturing environment should not be considered to be just another data processing or systems project. It is truly unique in many aspects.

Consider the following vs. a more traditional DP project:

- Installation will take place in a company function that generally consumes 60% to 80% of total budget.
- Labor skill levels have to be considered in light of equipment operations.
- Labor contract considerations require successful handling.
- Environmental factors are often hostile and require assurances for systems performance.
- Unique terminal features may be required to satisfy human engineering or practical considerations.
- The development staff must have in-depth knowledge and comprehension of the functional area.
- Almost all company functions are involved in a successful project.

When approaching such an undertaking, the following are key considerations that should be utilized:

- Obtain total commitment at the most senior levels of manufacturing and corporate management.
- Use the corporate task force project concept.
- Involve corporate functions in appropriate task responsibilities; i.e., involve manufacturing users for requirements definition, manufacturing and data processing for hardware selection (terminal usage) and accounting for appropriate definition of financial/cost requirements and consideration.

Donovan is president of Rolfe Associates in Wethersfield, Conn.

Wake me when it's over

Read the Year-End Review and Forecast, a special Supplement in the December 31st/January 7th combined issue of Computerworld.

What sort of a year was it? A year like all years - filled with those events that alter and illuminate our times. And you were there, as Walter Cronkite used to say. Now it's time to leave the trees and sit back for a good look at the forest. And that's what we'll be doing in our special, combined December 31st/January 7th issue.

Edited by Drake Lundell, this special issue will review all the big stories in the 1975 computer world - from developments in hardware, software and communications to changes in computer law and the impact of computers on society. It'll be an excellent overview of what's happened, combined with some knowledgable forecasts of what's going to happen in 1976. And if you have anything to do with computers, you should be there on December 31st.

If you're a DP marketer, remember the closing date for this special issue: December 12th. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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MINIWORLD

Mini Bits

MSC Offering HP Systems With 80-, 40M-Byte Disks

SANTA CLARA, Calif. – Microcomputer Systems Corp. (MSC) is shipping 40M-byte and 80M-byte disk systems interfaced to Hewlett-Packard HP-2100 and 21MX computers.

Operating under DOS and RTE, the MSM-10 disk systems provide a positive alternative to HP's 5M-byte and 15M-byte disk systems.

The disk systems consist of an Ampex Corp., Control Data Corp. or Century Data Systems, Inc. disk drive, MSC microprogrammed controller and host adapter.

Expandable up to 15 drives and multiported up to eight computers, the disk system can provide 4,500M-bytes of disk storage with a single controller.

Price for a 40M-byte system is $17,500. An 80M-byte system sells for $19,500 from the firm at 3068 Kenneth Ave., 95050.

HP Industrial Systems Prices Drop

CUPERTINO, Calif. – Reductions averaging about 8% have been made by Hewlett-Packard in the price of a series of computer systems used for measurement and control. Reductions are approximately $5,000 in HP 9611-series systems in the $65,000 price range. At the same time, contract maintenance charges on the system have been reduced 10% or more.

Floppy Interface Released

NATICK, Mass. – Control Logic, Inc. has developed an interface for the Sykes 7150 and 7250 floppy disk that will sell for $500.

The package includes interface documentation, diagnostic program, disk drive program and the disk operating system with assembler and editor. Systems using the software will require 3K bytes to 7K bytes of random-access (RAM) memory, depending on the program objectives of the system, according to the firm at 9 Tech Circle, 01760.

Intel Reduces Software Rates

SANTA CLARA, Calif. – A 50% reduction in microcomputer software royalty rates has been announced by Intel Corp.

The cuts, which went into effect worldwide on Nov. 1, should result in a savings to Intel users of some 25% of time-shared networks to program microcomputer systems, but do not apply to programs used in a background batch or remote-job-entry environment.

In Accounting, Circulation

Newspaper Saves $1,500/Mo With Minis

By Mal L. Stiefel
Special to Computerworld

SPRINGFIELD, Ill. – The *State Journal-Register*, a local daily newspaper, has scrapped its IBM 360/20-based card system in favor of two Digital Equipment Corp. PDP-8Es.

Each PDP-8E has 32K 12-bit words of main memory along with disk, tape, printer and on-line CRTs.

The units, installed in August 1974, support the paper's circulation and accounting functions at a saving estimated to exceed $1,500 a month, according to Computer Operations Supervisor Phyllis Harrison.

Increases in tab room personnel costs and CPU overtime charges triggered the search for a replacement in 1973, as the IBM 360/20 utilization consistently exceeded the 176-hour monthly base. The only systems considered to replace it were an IBM System/3 and the PDP-8s.

"IBM lost on cost," Harrison said. The $68,000 price tag on the two DEC systems was less than the cost of one System/3.

One machine, dedicated to the circulation function, carries a card reader and a Decision Data Corp. 8010 card punch that can be switched off-line and used as a conventional keypunch.

Otherwise, it is identical to the other system, which is dedicated to the accounting function.

Recently, while the circulation system was down for several hours, the accounting system backed it up performing critical file updates and reports – a benefit the lone System/3 wouldn't have afforded.

DEC supplied payroll, accounts payable and receivable and circulation application programs written in Dibol, running under the Commercial Operating System.

The accounts payable package became operational in November 1974 with relatively little rewrite needed.

The other programs, particularly the payroll package, were modified extensively by the paper's staff of one full-time and one part-time programmer. In addition, a general ledger/trial balance program was developed in-house.

Payroll is run once each week for the *State Journal Ledger's* 350 employees.

Once a week, 42,000 mailing labels are printed in a three-hour run: 6,000 each for Saturday's edition; 6,000 for Sunday; and 30,000 (6,000 names, five times each) for the daily issues.

About 1,000 advertisers' invoices and statements are printed each month. Charges are computed by lineage for classified ads and by the inch for display ads. The report also indicates those advertisers who have used their contracted space and those who haven't.

Every day, a carrier draw list and manifest is printed for the 750 newsboys and delivery agents, along with a listing of cash payments received from carriers. A total circulation report also comes out each day.

Other weekly reports cover the 13,000 paid-in-advance subscribers and the 4,000 who carry a subscriber accident insurance policy sold through the *State Journal-Ledger*.

The availability of the vital sort/merge utility program has been primarily responsible for the dramatic improvement in throughput realized with the twin minis.

Twelve-thousand records, each 100 characters long, can be sorted on a complex key in about five minutes. With the old system, this was done on the IBM 83 card sorter; the task took many hours.

Now, the 83 has been laid to rest. A low-speed IBM 548 60-column interpreter lingers, though, to interpret the cards punched on the 8010.

Since excess time is available on both systems, additional applications are being designed. Preliminary work is under way to provide backup for functions being performed on an IBM 1130 in the composing room, and a series of applications are planned, centered around a unified subscriber file.

System Industries Announces Billion-Byte Storage Systems

SUNNYVALE, Calif. – System Industries has announced it will expand its Series 9500 line of disk storage systems with two models, the 9500-64 and 9500-66, offering minicomputer users up to 1.2 billion bytes of storage at an average access time of 30 msec.

To implement the billion-byte storage system, System Industries connects four Control Data Corp. storage module drives (Model 9766) to its proprietary controller, which handles many software routines in hardware. The controller also automatically matches the performance of slower CPUs to the 1.2M-byte transfer rate of the CDC drives.

The Series 9500 line, with the new additions, will offer minicomputer users a choice of the four latest storage module drives developed by CDC.

These CDC drive models are the 9760 (40M bytes), the 9762 (80M bytes), the 9764 (150M bytes) and the 9766 (300M bytes). Up to four of the CDC drives may be implemented with the System Industries controller.

Regardless of which combination of drives the minicomputer user chooses, the Series 9500 provides a dual CPU interface option, whereby two minicomputers can share access to all disk drives attached to the controller. This option also allows communication between the two minis via the controller.

In single-unit quantity, the billion-byte storage system (9500-66), complete with controller, power supply, minicomputer interface plus all necessary cables and rack-mounting hardware, is priced under $60,000.

Also included with each system is a complete diagnostic software package and the option to select additional packages which allow the use of the minicomputer manufacturer's operating system software.

The company reports the models will be available beginning in March from its headquarters at 535 DelRey Ave., 94086.

Users Can Now Lease IBM 5100 From TSR

GREAT NECK, N.Y. – Users who are interested in IBM's 5100 portable computer but prefer to lease the device, can do so from Time Sharing Resources, Inc. (TSR) here.

While IBM offers the 5100 as a purchase-only system, TSR will provide three-, four- or five-year full-payout leases.

The APL time-sharing company also provides installation help and optional software, a spokesman said.

The 36-mo leasing rate is based on a monthly charge of $34.93 for each $1,000 of the system's purchase cost, a spokesman said.

A 48-mo lease rate is about $28.21/mo per $1,000 of purchase price, and the 60-mo rate is about $24.26/mo per $1,000 of system purchase price.

IBM maintenance would add $55/mo to $85/mo to the price.

TSR, which has financing for the project from the Chemical Bank, hopes the leasees will eventually become customers of its time-sharing service, the spokesman said from 777 Northern Blvd., 11022.

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buy a 31-user system for less than $5,200 per user.

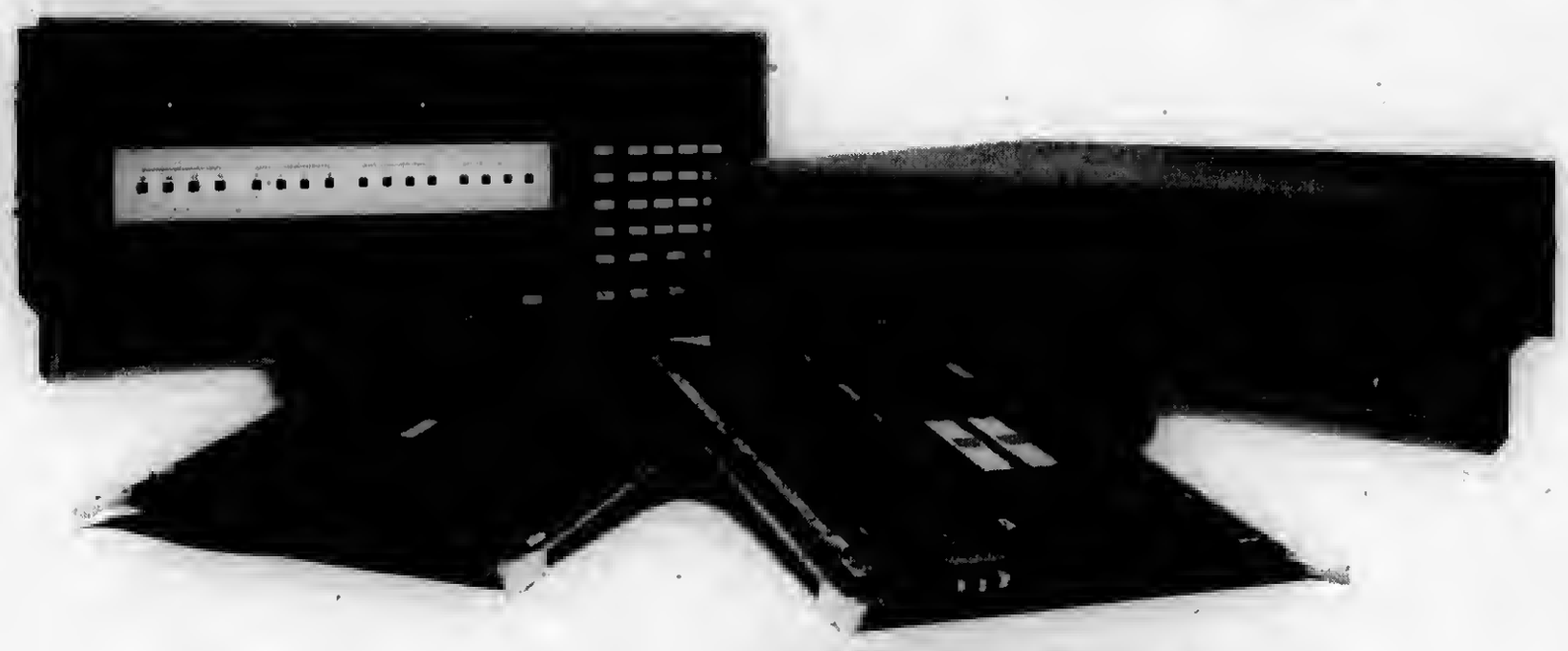
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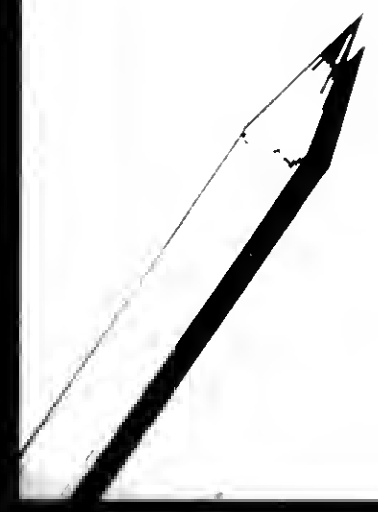
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Based on 8200 Mini

NCR Has Small Hospital Turnkey System

DAYTON, Ohio – NCR Corp. has introduced an interactive computer system with multiprogramming capability for small hospitals and clinics.

Called the NCR Interactive Health Care Information System (Ihis), the system offers six integrated application programs providing for patient processing and general accounting. Built around an NCR Century 8200 minicomputer, the system includes a central processor, terminals, matrix printer and disk unit.

The Ihis system provides a combination of data base, interactive and multiprogramming techniques in a turnkey system for the smaller health-care facility, according to an NCR spokesman.

All data is entered through CRTs. The data is verified and posted to the files involved. The terminals are also used to retrieve information from the system, either on the CRTs or in printed form.

NCR can tailor applications and files to the user's individual requirements using special software called an Application Customizer, the company said.

One or all of the six application programs may he used, depending on customer needs. Step-by-step "lead-through" instructions are flashed on the CRTs to obviate extensive operator training, NCR said.

The six on-line applications are: inpatient processing, outpatient processing, patient accounts receivable, health care accounts payable, health care payroll and health care general ledger.

All applications are programmed in Cobol 74 and operate under the Interactive Multiprogramming Operating System.

The basic 8200 configuration required for the system includes a 40K processor, one matrix printer, one visual display terminal and a 4.9M-byte disk unit.

Memory can be added in increments of 8K up to 128K. As many as seven CRTs and two printers can be added to the basic configuration.

An entry-level hardware configuration sells for $35,420 and rents for $860/mo under a five-year contract. Application modules are separately priced, with monthly license fees of $10 to $30 a month. The modules also carry an initial one-time installation fee of from $250 to $500.

All six application modules, including the inpatient processing extension, rent for $110 a month.

Customer deliveries will begin in the second quarter.

MDB Links Printers, Interdata Computers

ORANGE, Calif. – A line printer controller that is software- and hardware-compatible with Interdata, Inc. minicomputers is available from MDB Systems, Inc.

The controller is a single printed circuit half-board that fits into any Interdata 15 in chassis, MDB said.

The controller costs $750 from the firm at 981 N. Main St., 92667.

Dataram Offers 16K, 8K Core For PDP-8 Line

CRANBURY, N.J. – Dataram has introduced the DR-118 and DR-118/A single-board 16K core memory systems for use with Digital Equipment Corp.'s PDP-8 minicomputers.

The Dataram systems are Omnibus-compatible and can be inserted directly into the backboard of the host minicomputer, Dataram said. The DR-118 is compatible with the PDP-8/E, -F, and -M, and the DR-118/A is compabible with the PDP-8/A-400 and the PDP-8/A-500.

The 16K by 12-bit and the 8K by 12-bit units cost $2,045 and $1,860 from the firm at Princeton-Ilightstown Road, 08512.

Litton Memory Ups 704 Capacity

CANOGA PARK, Calif. – A core memory which is said to double the capacity of the Raytheon 704 processor within its chassis while using the existing power supply has been introduced by Litton Memory Products Division of Litton Industries.

The Litton LM-804 core memory is said to be the only add-in unit available that can increase the normal 704 maximum memory capacity from 16K to 32K.

The Litton memory has a capacity of 8K words by 18 bits word length or 4K words by 18 bits word length with a cycle time of 1 μsec and an access time of 300 nsec. It is available immediately from the firm at 360 N. Crescent Drive, 90210.

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COURSE: HOW TO TEACH STRUCTURED COBOL

The philosophy behind this course is to give the COBOL programming instructor the educational know-how to teach structured programming to beginners. Familiarity with COBOL is required. The course handout includes Part I of Learning to Program in Structured COBOL by Ed Yourdon, Chris Gane and Trish Sarson. Course fee: $300. Dates and locations: Jan. 15-16, Washington, D.C.; March 18-19, Toronto; April 5-6, San Francisco.

COURSE: HOW TO BE AN EFFECTIVE DATA BASE ADMINISTRATOR

This course gives detailed guidelines to assist the data administrator in the organization and collection of corporate data; in the design of physical structure of the data base; in the creation of new data; in the expansion and reorganization of the data base; and the optimization of data base performance.

One of the major topics discussed is the data administrator's role in the corporate organizational structure. Problems are discussed and pragmatic solutions suggested. Course fee: $300. Dates and locations: Dec. 11-12, Washington, D.C.; Feb. 2-3, New York City; April 8-9, Chicago.

COURSE: HOW TO SELECT AND INTEGRATE ON-LINE SYSTEM COMPONENTS

Much of the emphasis in the designing of today's on-line systems is deciding which teleprocessing packages (CICS, INTERCOMM, etc.) should be interfaced with which data base packages (IMS, TOTAL, etc.) and which operating system. This newly revised and updated seminar deals with these issues as well as terminal selection, performance measurement, application programs, recovery and back-up, and the human engineering aspects of on-line systems. Course fee: $300. Date and location: Feb. 25-27, New York City.

For more information call Ms. Rikki Moss at Yourdon inc. 212 575-0572 or send this coupon to:

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Mini Bits

Wang 2200 WCS Systems Get Data Collection Board

TEWKSBURY, Mass. – Wang Laboratories has added a controller board that is said to provide a low-cost means for the company's minicomputers to acquire on-line data from digital instruments used in research and testing.

The Model 2252A scanning input interface controller plugs into any I/O slot in a System 2200 or WCS series CPU and accepts readouts with a sign and up to 10 hinary-coded decimal (BCD) digits (or 40 hinary data bits) in parallel, Wang said.

Compatibility with digital devices is aided by six logic-level-selection switches on the controller which allow signal levels to be inverted easily. The four number-of-digits switches can be set to indicate the exact number of BCD digits per read-out, thereby reducing data transfer time for applications with fewer than 10 BCD digits, the vendor added.

Four control signals on the board, which indicate data request, data transfer in progress and data transfer complete, can be utilized or ignored by a particular device as required.

The Model 2252A costs $600 from the firm at 836 North St., 01876.

Randal Enhances Printer

TORRANCE, Calif. – Randal Data Systems is offering an enhanced version of the Decprinter I, a 180 char./sec line printer recently introduced hy Digital Equipment Corp.

Options available from Randal include an RS-232 interface with 512-character buffer, a polling adapter and an additional 512-character huffer.

Standard Decprinter I features include upper- and lower-case 96-character Ascii output, 132-column print capability, ability to handle varying form widths (3 to 14-7/8 inches) and form sets up to six-part), paper-out switch, top-of-form, self test and backspacing capability.

The paper-feed system employs dual tractors with 4-pin engagement and a vernier knob for paper positioning.

The Randal printer costs $3,085 or $92/mo lease. With a buffered RS-232 interface, the printer costs $3,585 or leases at $108/mo.

First deliveries are in January from the firm at 2807 Oregon Court, Building F, 90503.

Tab Aims Decollators at Small Users

PALO ALTO, Calif. – Tab Products Co. is now offering two two-part forms decollators designed and priced specially for the IBM System/32, System/3 and small minicomputer systems users.

The tabletop Model 2422 will cost about $450. Model 2424, the floor model, depending on options, will "also be priced helow competitive machines," according to Tab.

Both units are capable of decollating continuous forms at speeds up to 450 ft/min and are designed to take up a minimum of floor space. Tab said.

Tab is at 2690 Hanover St., 94304.

EASTERN SIERRA POLICE INFORMATION SYSTEM

Specs are available for bids on mini-computer hard-ware and RTDOS.

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207 West Line
Bishop, Calif. 93514
or phone (714) 873-5866

Deadline for inquiries Nov. 30. Bids Due Dec. 29.

In French Medical Center

Mini Speeds Tests of Disabled Patients

VALENTON, France – A Data General Corp. Nova minicomputer installed at a medical research center here is playing its part in helping to restore disabled patients to a normal life.

The center is associated with the Centre de Reeducation et d'Appareillage, which specializes in the fitting of artificial lower limbs and the rehabilitation of patients.

Each year, some 800 patients pass through the rehabilitation center, which is run by the Association for the Development of Reparatory and Orthopaedic Surgery.

The Nova 1200 system is used with an apparatus for the analysis of a patient's walk based on measurement of its strength.

The examination process is conducted as follows: A disabled person's identity is typed on a printer along with the order for the process to begin.

The patient is then invited onto the walk-way and asked to proceed according to the required measurement, on to one of two boards.

The boards each have 10 sensors positioned to measure the pressure exerted on the board by the patient as he moves. This pressure is calculated for graphical analysis along x, y and z axes – two horizontal and one vertical.

The graphic information is recorded every 1/100th of a second. The subject's weight is analyzed to form the strength unit while the foot size gives the length unit for the displacement of strength.

The system supplies, for its part, numerical data allowing the graphs to be interpreted (time-length of step, weight of individual), the value of certain measurements calculated in comparison with those preceding and the exact meaning of certain significant variations in the curves. It gives an instantaneous numerical evaluation of the patient's walk by the analysis of the above measurements following a program adapted to a given problem.

This numerical evaluation of physical facts carried out for each examination and obtained by a parallel graphic translation constitutes an essential progression brought about by the integration into the system of a minicomputer and its printer.

Today from eight to 10 examinations can be made in one hour. The whole procedure, from the taking of measurements to their interpretation, demanded about six hours per examination in the past.

silent 700
electronic data terminals

Texas Instruments "Silent 700" programmable data terminals:

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"Silent 700*" Model 742 programmable data terminals offer a lot more than mere intelligence for business management systems.

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A quiet, self-contained thermal printer gives you a retainable audit trail of transactions for easy reference, routing and filing.

The simple TICOL language lets you generate your own user programs on the terminal itself, with no separate equipment or central computer support required.

And the same terminal package holds all the communications features and options you need to move data to and from your computer or other terminals.



Versatile "Silent 700" programmable data terminal offers easy operation and powerful options for many business management systems.

Cost-effective performance

Standard in each "Silent 700" programmable data terminal is the microprocessor and memory capacity to handle most user applications.

For applications requiring increased capacity, additional memory with a more powerful TICOL language can be added as an option in the same terminal package.

Dual magnetic tape cassettes let you store your programs and data conveniently, for later transmission to your computer.

And combined with these powerful performance features are quiet 30-characters-per-second printing speeds and communications features that help reduce over-all system costs.

Improving man's effectiveness through electronics

Turnkey Mini Untangles Textile Firm's Inventory

NEW YORK – "The textile industry has always had very serious difficulties keeping an accurate perpetual inventory," according to William Levin, president of Gold Mills, Inc., which has largely overcome the problem through the use of a minicomputer.

"In all too many instances," Levin continued, "what's on record does not match what is physically in the warehouse or sometimes, more importantly, what is in process. One then is confronted with an unpleasant surprise at inventory time."

Gold Mills uses an on-line interactive minicomputer system that not only maintains an inventory from moment to moment, but also produces significant cost savings in several different parts of the company.

In one department alone, cost savings with the minicomputer system are estimated at more than $75,000/year.

Built around three minis from Interdata, Inc., the Gold Mills system was installed and is managed on a turnkey basis by G&L Computer Corp. here.

The system links Gold Mills corporate headquarters here with its knitting and dyeing facilities in Pine Grove, Pa.

One of the problems of achieving an accurate inventory focused on that group of employees known as converters, men and women who convert a customer's order into appropriate manufacturing and distribution instructions for the Pennsylvania plants.

Prior to the installation of the mini system by G&L, it was possible for these converters, sitting at adjacent desks, to order out the same goods once, twice, even three times, Levin reported.

And it might then be weeks before the accounting department straightened out the paperwork to resolve the discrepancies.

"Now, a converter sits at a CRT that is on-line to the mini. Every transaction is entered into the system, which will then block any and all subsequent attempts to duplicate orders from another converter," according to Jules Grandonico, president of G&L.

Converters are by no means the only employees who are on-line to the system. Grandonico said the invoice department at Gold Mills headquarters formerly consisted of eight clerks, who were "always behind on their manual processing of paperwork."

Now, he continued, "one Gold Mills clerk and a terminal produce current invoices every day. Indeed, that one clerk usually finishes the day's invoices before the close of business."

Estimated net savings to Gold Mills in the invoice department alone were more than $75,000 each year, plus the added dividend of greatly improved performance.

Because the manufacturing plants in Pennsylvania operate three shifts per day, seven days a week, there is a never-ending flow of data to New York. "We never close," Grandonico said. "The system is always working."

At Gold Mills, the hardware in the G&L system includes three Interdata minicomputers: two Model 70s and one Model 5, each with 32K bytes of core memory. The Model 5 serves as the communications interface between the Model 70s and terminals in Pennsylvania and New York.

There are four 2.5M-byte disk memories, a 29M-byte disk memory and five matrix printers. The CRT terminals at the manufacturing plants in Pennsylvania and at Gold Mills corporate headquarters in New York each contain 2,000 bytes of intelligence in the form of read-only-memory (ROM).

Custom Features

They also have special custom-installed features such as a transmit light that locks the keyboard while the operator awaits a response to his most recent query or data entry.

The terminals in Pennsylvania transmit data to the Model 5 minicomputer in New York over two dedicated C-2 lines, each transmitting about 10M bytes of data per day at a rate of 3,800 bit/sec.

Similarly, data flows from the terminals in New York to the plants in Pennsylvania. Transmission rate within the New York headquarters from terminals to the Model 5 minicomputer, is 9,600 bit/sec.

Software for the minicomputer system at Gold Mills is based on a real-time operating system developed by G&L Computer Corp., which has also developed application packages such as inventory control, order entry, accounts payable, accounts receivable and invoicing.

CDC Memory Module Aimed at OEM Firms

MINNEAPOLIS – Control Data Corp. has introduced a core memory module for use by OEM builders of small computers and communications equipment and add-on memory suppliers.

The CDC Model 94320 core memory module is plug-compatible with the Ampex Corp. 1620 memory. The basic 16K by 20-bit module has a 750-nsec cycle time, 300-nsec access time and uses the recently announced CDC Unitemp core for constant operating temperature margins and reduced cooling requirements, according to the firm.

In addition to the basic unit, suppliers and manufacturers may choose 16K by 16-bit or 16K by 18-bit modules. Rack and power supply options also are available. Price for the 16K by 20-bit unit is $1,325 in OEM quantities. Deliveries will begin in the first quarter.

Systems network adaptability

If your business system involves tying your Model 742 terminals together in a complete communications network, TI offers the Model 700 TPS* Terminal Polling System.

Designed around the TI Model 960 Series minicomputer, the TPS automatically calls remote "Silent 700" data terminals, collects data stored on the magnetic tape cassettes, and logs the data on magnetic tape in a format readable by a host computer.

This scheme gives users a complete, cost-effective data capture network for distributive data processing and communications.



International Harvester dealers throughout the country use "Silent 700" programmable data terminals for quick, economical management of inventory and accounting data.

International Harvester found more . . .

International Harvester, which recently selected a large quantity of these models for use by its dealers for remote data entry and local processing in Service Parts Inventory Management and Dealer Accounting Data Services, has this to say:

"The TI terminal answers International Harvester's needs — simplicity of operation, nationwide service and the capacity to fill our dealers' requirements at a moderate price."

International Harvester dealers throughout the country will benefit from reduced information transmission time, better control of warehouse parts inventory and smoother daily operation with continually up-to-date information.



Model 700 TPS Terminal Polling System links the TI 960 Series minicomputer with "Silent 700" terminals for a complete data network.

What's your application?

If you're interested in an affordable solution for your distributive data processing and business management systems needs, contact the TI problem-solvers at the nearest office listed below. Or, write Texas Instruments Incorporated, P.O. Box 1444, M/S 784, Houston, Texas 77001. Or, call Terminal Marketing at (713) 494-5115, ext. 2126.

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If you're involved in one of the areas shown, you should attend the EDP Seminar Series this fall. What you learn will benefit your company, your installation, and you.

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

San Francisco	**Dunfey's Royal Coach**	**Jan. 9-10**
New York	**Summit Hotel**	**Feb. 23-24**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

New York	**Essex House**	**Jan. 26-27**

Data Base Design

Given in association with Leo J. Cohen and Performance Development Corporation, this three-day seminar is a package-independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimum File Organization/Indexing Techniques, File Integration, and much more.

Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300

Denver	**Denver Hilton**	**Dec. 1-3**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

Chicago	**Hyatt Regency O'Hare**	**Nov. 19-20**
Washington, D.C.	**Marriott Crystal City**	**Feb. 4-6**
Orlando, Fla.	**Sharaton Towers**	**Feb. 18-20**

Data Communications Course #1010 – Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

Miami	**Marriott Miami Beach**	**Nov. 17-18**

Data Communications Course #1020 – Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Miami	**Holiday Inn Airport Lakes**	**Dec. 1-3**

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COMPUTER INDUSTRY

CI Notes

DPF to Lease Amdahl Units

HARTSDALE, N.Y. – Pursuant to its agreement with Amdahl Corp. to provide long-term lease financing for up to $160 million worth of Amdahl Corp. computers next year, DPF, Inc. has been negotiating with banks and other financial institutions.

Leases are expected to be five to seven years, according to DPF Chairman Bertram J. Cohn, who said the move to handle Amdahl equipment is part of an overall growth program DPF plans for next year.

DPF is prepared to invest some of its own funds in both operating and long-term leases, Cohn said.

On-Line Gets English Base

PITTSBURGH, Pa. – On-Line Systems, Inc. has completed the acquisition of Leasco Response Ltd. in the UK, marking the company's entry into the European computer services.

The newly acquired British company will be operated as a wholly owned subsidiary and is expected to be renamed On-Line Computer Services (UK) Ltd., On-Line President Jack Roseman said.

Memorex OEMs Components

SANTA CLARA, Calif. – Memorex Corp. has expanded its thrust into the OEM world by including equipment components such as disk drive heads, printed circuit boards and cables in its lines of products.

Robert J. Chartrand was named OEM components marketing manager.

Memorex previously sold these components for OEM application on a limited scale.

Ball Buying Caelus Disk Line?

SUNNYVALE, Calif. – Ball Corp. has reportedly purchased the 40M-byte and 80M-byte disk lines of Caelus Corp. here from Electronic Memories and Magnetics Corp.

Under the deal, which will be announced early next month, Ball will take over the Caelus plant and personnel here, sources said, and will market the disk units through Ball Computer Products.

Calcomp Drops 6,250 Bit/In. Effort

ANAHEIM, Calif. – Count California Computer Products, Inc. (Calcomp) out of the 6,250 bit/in. tape drive arena.

President Lester D. Kilpatrick told shareholders, "It is recognized that under present conditions Calcomp is capital-limited and that operating in a positive cash flow mode must take precedence over revenue and product growth . . . Calcomp has narrowed its product lines to the memory and graphic areas where our strength is greatest," he said.

Cites Small Market Share

Lacey Explains CDC's Profit Picture

By Edith Holmes
Of the CW Staff

NEW YORK – Control Data Corp.'s poor showing in the area of profits since its founding in 1957 is attributable to too small a market share among other factors, John W. Lacey, senior vice-president, said recently at hearings of the U.S. vs. IBM antitrust case here.

Lacey said although revenues indicate an impressive growth at CDC, "in terms of profits and fair share return to stockholders, the growth looks very bad."

Other factors affecting CDC's profit level are the lack of an image of success and reliability cemented in the minds of potential customers and a failure to achieve the economies of scale that participation in the industry demands, he said.

In contrast with CDC, IBM has derived its power in the marketplace from these very areas, he said.

Lacey estimated CDC holds a 2% to 4% share of the market, with IBM at 60% to 70%.

Growth First

The objective within CDC was growth first and profitability second until 1971-1972 in order to achieve certain economies of scale, he said.

Difficulties in financing and obligations to shareholders among other factors have led to a shift in emphasis from revenues to profits, he said.

Over the past five years, CDC has had trouble acquiring financing, according to Lacey. While not directly responsible for financing in CDC, Lacey said in 1971 and this past summer banks headed by Chase Manhattan had told CDC it could expect very little additional financing unless and until its profitability went up.

CDC suffered "a significant loss measured in 10s of millions of dollars" from the sale and lease of its computer systems in 1974, Lacey said.

Pricing Procedures

He illustrated the influence IBM has on CDC by detailing his company's pricing procedures.

At CDC, general pricing guidelines take the prices of other manufacturers into consideration, but are chiefly concerned with those of IBM, Lacey said.

On an average basis, CDC prices its systems 5% to 10% below those produced by IBM, Lacey testified, although this does not happen in every case. He noted the difficulties of comparing products in a high-technology market like computer systems.

CDC will be 40% higher or 40% lower in some instances when compared with IBM pricing, depending on the problems the customer needs to solve and the power he must have to accomplish these tasks.

Lacey said CDC reviews and reevaluates its prices when the volume sold or the manufacturing costs change or when there is a competitive shift in price – particularly if it is initiated by IBM.

In pricing peripherals, CDC is generally 10% to 15% below IBM, adding that in the plug-compatible market, comparisons between equipment abilities are much more objective than in assessments of the relative powers of systems.

CDC has tried to reduce the price differential between CDC and IBM equipment in this area, especially with its add-on memories, he said, adding the company has not been successful in this effort.

IBM Blames Unsuccessful Ventures

Attorneys for IBM attempted to show CDC's computer systems business was great enough to allow the company to engage in several unsuccessful- or profitable-in-the-long-run ventures.

In addition, they attempted to prove CDC incurred losses by engaging in these ventures rather than through competitive clashes with IBM.

Lacey was questioned about several ven-

(Continued on Page 46)

Report Highlights Industries With Large DP Growth Potential

By Nancy French
Of the CW Staff

WALTHAM, Mass. – Eighteen industries show an untapped DP spending potential ranging from a low of $200 million to a high of $2.7 billion, according to a study completed here recently by International Data Corp. (IDC).

Of these, hospitals, commercial and stock savings banks, automotive dealers and supermarkets show a total spending potential of $4.8 billion, the report said.

Hospitals are in the lead, according to "Target Industries for Computer Services and Minicomputers," with almost $2.7 billion in spending potential. This figure is 4.6 times that of commercial and stock savings banks, the next highest market, the report said.

IDC researchers arrived at these estimates by measuring 1974 DP spending in organizations from key Commerce Department Standard Industry Classifications (SIC) that budget from $10,000 to $200,000 per year for DP activities.

Spending levels of organizations at individual 2-, 3- or 4-digit SIC levels were compared with spending for those industries' most progressive organizations to determine DP spending potential, an IDC spokesman said.

"Hospitals [SIC 806] are a long way from realizing the $2.7 billion potential, however, because only a few currently spend at the $7/patient-day rate of the most sophisticated DP users, and many of the smallest ones might never justify it," the report said.

Commercial and stock savings banks (SIC 602) are far more thoroughly penetrated, and some of the $587 million remaining potential will be erased by 1974 DP spending by correspondent banks, the report said.

However, increasing development of electronic funds transfer systems (EFTS) will boost the total potential significantly during the next few years, the report said.

IDC's estimate shows a $496 million untapped market in the automotive dealers category (SIC 551) but cautioned that the report measured current spending on in-house, general-purpose computers, and since auto dealers tend to rely heavily on computer service organizations, rather than in-house DP, the potential found here may be "slightly overstated," the report said.

Supermarkets (SIC 541) are on the brink of big point-of-sale decisions, according to the report. Nearly $447 million in potential DP spending exists in the supermarket area, the report said.

SIC categories 13 and 29 of the oil, gas and petroleum industry still show nearly $360 million in DP spending potential, the report said.

Department stores (SIC 531) show $356 million in DP spending potential, and savings and loans, $346 million.

In the insurance industry, fire, marine and casualty insurance (SIC 633) still represent $307 million in DP spending potential, compared with the more highly automated life insurance firms, which have less than half this potential, according to IDC.

Saturated industries mentioned in the report include sugar and confectionary manufacturing, the weaving and finishing industry, household appliance manufacturing and the paper products industry.

A chart of total 1974 U.S. DP spending included in the report indicated that DP spending by manufacturers represented 34% of last year's DP business, and that of financial institutions, 22.5%. Education was third, with 9.7%, and retail fourth, at 7.1%.

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RAYTHEON

GE Lacked Management Commitment to DP: Weil

By Edith Holmes
Of the CW Staff

NEW YORK – General Electric Co. (GE) lacked management commitment necessary to continue in the computer business, according to Dr. John W. Weil's testimony here recently at the U.S. vs. IBM antitrust trial.

GE's management believed a company had to have at least a 10% to 15% market share of the computer industry to be successful, but GE had held between 2% and 4% during the 1960s, said Weil, formerly in charge of Advanced Systems Technology with GE's computer department.

One major reason behind GE's decision to sell its computer business to Honeywell in 1970 was the belief it would not attain such a market share, said Weil, the first of four witnesses who will testify about GE's sojourn in the computer industry.

GE had devised many ambitious tasks and attempted efforts often over its head technically, he said. The firm never developed a management experienced enough in the computer industry to understand it, Weil said.

Nuclear Power Commitment

He illustrated his former company's lack of commitment to computers by comparing its interest in developing nuclear power.

Consisting of no more than 1% to 3% of GE's total business, computers were always considered a sideline – a business the company could easily get along without if resources became scarce or profits dipped, Weil said.

By contrast, GE was a strong supplier of equipment to the power industry, and any development of nuclear power without GE's active involvement would have threatened its entire operation, he added.

Weil noted that in the early '60s the company couldn't seem to keep a manager in charge of its computer business for more than 18 months at a time.

No one with responsibility for computer systems ever achieved a sufficient understanding of the industry to know what to do, Weil said.

While GE's notion of management as a profession worked well in pure industries and in those that were growing slowly or gradually, it did a disservice to the company's computer business, he said.

Weil said back in 1963 he believed GE had the capital resources and technological capabilities necessary to make it a major force in the computer systems business and in the industry as a whole.

The company had a broad technological base in many different businesses applicable to computers. It had used computer systems broadly itself and so understood the problems encountered by users as well as anyone, he said.

At that time, GE had the capital resources available to successfully put together a technological and marketing effort in this field, Weil explained.

Naive in Manufacturing

The company was relatively naive with respect to the discipline required to manufacture large computer systems, he said.

Weil testified that, in retrospect, GE realized it had gotten in over its head with its contract with MIT to develop an advanced time-sharing system inthe '60s.

In conceiving and specifying the system features for Multics and the GE 645 mainframe, MIT assumed the position of leadership, and GE underestimated the difficulty it would have in actually building the necessary devices, Weil observed.

The system did eventually operate in the way it was intended to, he said, but when it did get off the ground, Project Mac was three years behind schedule. There were two major problems, according to Weil.

One was technical in that the tasks were very sophisticated for their time – very much state of the art, he noted. The other consisted of the communications problems faced when an industrial organization, a utility and an academic institution tried to work together on the same project, Weil added.

The former GE executive testified the 645 was removed from the market shortly after its introduction in 1965, and GE never again offered it as a product, although Honeywell did later on.

Weil added he was certain GE lost money on the project.

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CDCer Cites Reasons For DP Profit Scene

(Continued from Page 45)

tures that have caused CDC financial problems and that, in some instances, continue to do so.

Among the projects he was asked to discuss were CDC's acquisitions of C-E-I-R, Inc. seminar operations and Ticketron. IBM attorneys also asked about CDC's data centers operations, a contract with the Union Bank of Switzerland, and advanced logistics systems project for the U.S. Air Force and CDC's Star program.

CDC saw these areas as the wave of the future for DP, IBM counsel contended. If CDC lost money on these ventures, it was because their time had not yet come, rather than that CDC had suffered from IBM's market power, the defense attorney tried to show.

Lacey answered specific questions on each of these projects, but would not assent to the overall sense of what the defense wanted to prove.

When asked whether he considered leasing or selling systems more profitable, Lacey said he had no view on the matter.

On the surface, gross profits over the years are higher for leasing than they are for purchasing, he noted.

Many systems introduced in the early 60s are still being leased by customers and considerable revenue associated with these systems has yet to be obtained by vendors.

"No one will know the full answer to lease vs. purchase profitability until those systems are no longer in the market," Lacey said.

In addition, there is considerable debate as to the extent to which marketing and research and development expenses are most profitably expended on the lease or the purchase base.

Lacey said he had debated the whole question heavily in his mind, but has reached a point where he cannot draw conclusions.

Something Old, Something New In CDC Cyber 170 Series Systems

By Molly Upton
Of the CW Staff

ARDEN HILLS, Minn. – In its Cyber 170 series, Control Data Corp. has retained some features of its earlier products such as refrigerant cooling and twisted paired wire, but has also instituted the use of integrated circuits in the central processors of all but its largest model, the 175.

CW at CDC

All machines in the series use refrigerant cooling as one of the key factors in reliability of integrated circuits is the junction temperature, said Mike Guilfoyle, senior consultant in the Computer Development Division.

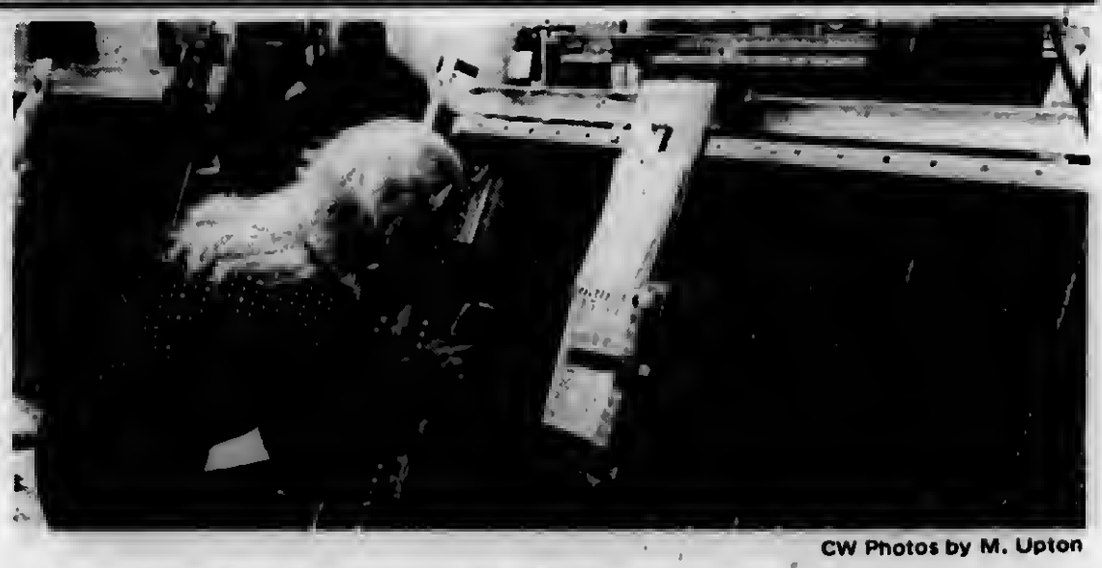
CDC continues to use twisted wire, he said, because the firm has "always stressed process performance" and this technique helps avoid sensitivity to noise and timing anomalies.

The systems use semiconductor memory, and Models 172, 173 and 174 have integrated circuitry for the CPU, he said, while the 175 uses high-speed discrete transistors.

The Cyber 170 series, a replacement for the 70 series, offers increased performance to each equivalent model of the 70 series, he said.

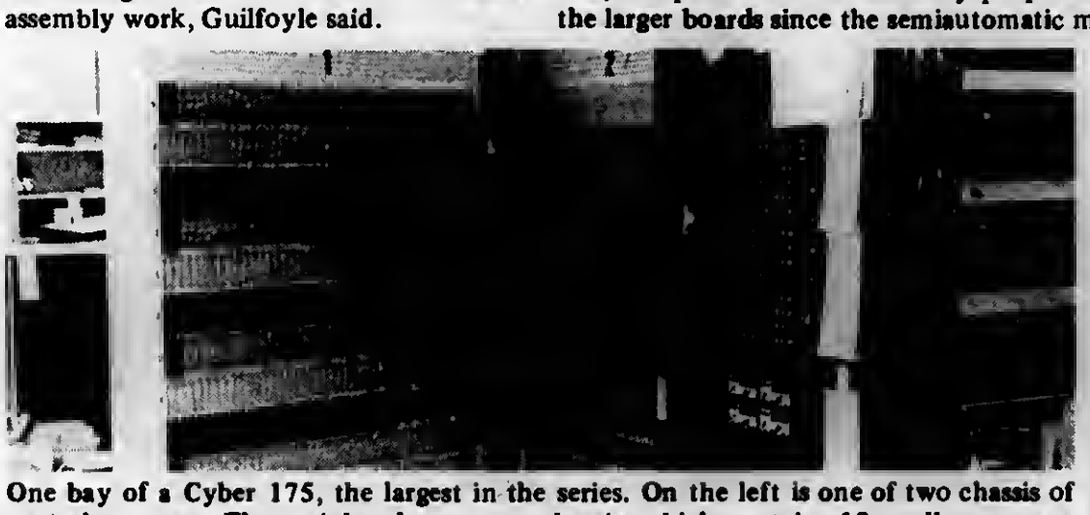
The Cyber 170 series offers users the ability to be unaffected by power disruptions of up to 2.5 seconds through flywheel techniques.

With the advent of the 170 series, CDC has brought back to the U.S. overseas assembly work, Guilfoyle said.



CW Photos by M. Upton

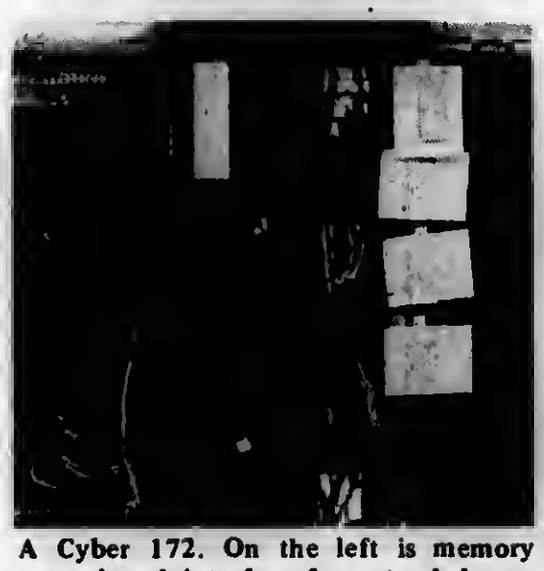
Yes, computers are still made by people. Backaching job of wiring is done by hand on the larger boards since the semiautomatic machines cannot handle these.



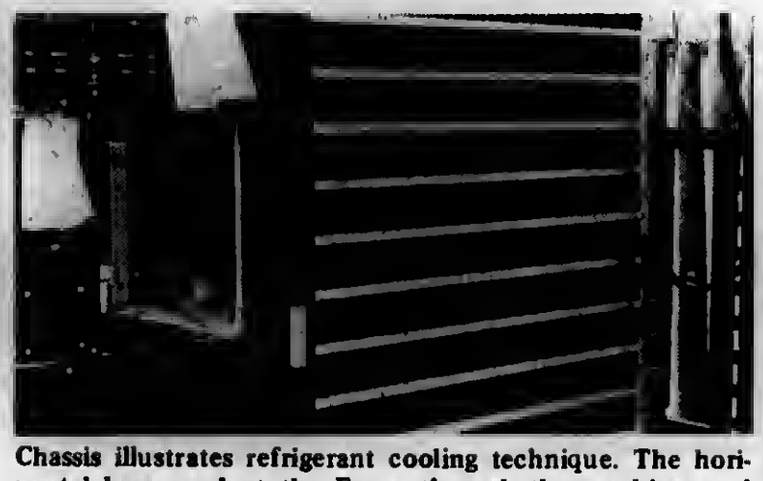
One bay of a Cyber 175, the largest in the series. On the left is one of two chassis of central memory. The peripheral processor chassis, which contains 10 small processors handling I/O and other functions, is on the right. Maximum configuration of a 175 is 20 peripheral processors and 256K words main memory. Two 175s have been shipped to customer sites in the U.S. and Germany.



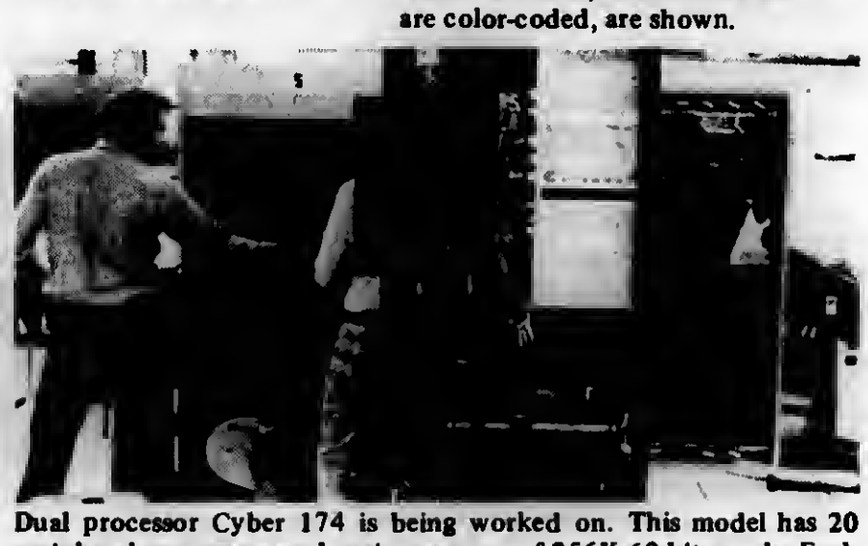
Miles of wires, some of which are color-coded, are shown.



A Cyber 172. On the left is memory control and interface for extended core storage, which runs between 125K to 10M words. The central processor is on the right, with integrated circuit memory.



Chassis illustrates refrigerant cooling technique. The horizontal bars conduct the Freon through the machine, and the coolness is transmitted by the vertical pieces.

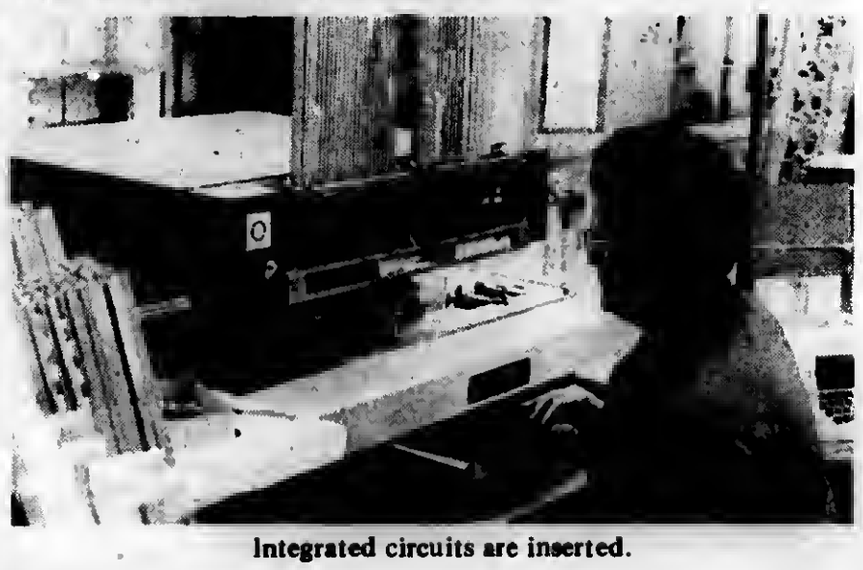


Dual processor Cyber 174 is being worked on. This model has 20 peripheral processors and main memory of 256K 60-bit words. Each word has 8 additional bits of error correction.



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Trade Balance Shrinks; DP Imports Outpace Exports

WASHINGTON, D.C. – Although the U.S. balance of trade for the first half of this year was positive, it declined 2.9% from the balance for the same period a year ago.

Increases in imports, including those in the area of computer and related equipment, and a leveling off of exports were cited as causing the declining balance.

Exports of computers and related equipment rose 2.7% during the first half, to $1.1 billion, but imports of computers and related equipment rose 16.7% to $63 million compared with $54 million in the same year-ago period, the Commerce Department said.

The U.S. showed a favorable balance of trade of $828.6 million during the first half of this year, compared with $853.3 million in the first half of 1974, according to the Department of Commerce figures.

Exports of all commodities were about $1.3 billion, the same as in the first half last year, but imports rose 5.3% to $494.2 million, Commerce said.

Computers' Share

Computers and related equipment accounted for 83.2% of total U.S. business machine exports during the first half, with Canada the biggest customer, taking $151.7 million worth of equipment, the Commerce figures showed.

The second largest purchaser of this type of merchandise was the UK with $148.8 million, followed by West Germany with $127.1 million, France with $114.9 million and Japan with $97.5 million.

The European Economic Community was the largest supplier of business machine imports to the U.S., with $168.8 million or 34.2% of the total for the first half, an increase of 20.1% over the same period last year.

Japan sent $127.1 million, down 10%, while Canada sent $48.3 million, down nearly 4% from its year-ago figures, according to Commerce.

Imports from the Far East were valued at $172.7 million; from Latin America, $59.3 million; the Near East, $6.1 million; and from socialist countries, less than $50,000, the figures indicated.

The European Economic Community bought $591.9 million or 44.8% of total U.S. business machines exports, an increase of less than 1% over the first six months of 1974. The Far East purchased $160.1 million; followed by Latin American countries, $128.4 million; the Near East, $25.2 million; and socialist countries, $18.1 million, Commerce figures indicated.

Exports to Canada declined 5.2% to $196.5 million. Purchases by Japan of $105.2 million declined 23.7% from the same period a year ago.

Slicing the figures another way, the U.S. high-technology, electronics-oriented industries showed a favorable balance of trade of $1.4 billion for the first half, a gain of 44% over the year-ago figures, Commerce said.

The improvement was the result of a larger reduction in imports that counterbalanced a slight decline in exports, Commerce said.

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But Money Lacking

Analysts Like High Technology

MONTEREY, Calif. – Financial analysts are still enamoured by high technology – but they feel there is less money available today to start new technology-based businesses.

These are two conclusions of a poll of financial analysts who attended a recent conference here sponsored by the Western Electronics Manufacturers Association (Wema).

"Forty-three – or 93% of those responding – said that technology still has a special appeal to the financial community," said Joseph Radoff, vice-president of Simon Public Relations, which conducted the survey.

Breaking down the financial community into five subsections, 28.5% of the analysts felt sophisticated investors were most receptive to new technological concepts. Institutions were ranked as the next most likely source of investment, with 26%. Fund managers were rated 24%.

"Surprisingly, small individual investors with 11.5% ranked higher on interest in new technologies than did brokers, who showed only 10%," Radoff noted.

Half of the analysts said there was money available for new technology ventures – and another 12% said there were limited funds that could be obtained by the "right man with the right reputation." But only 38% felt money was in greater supply now than it was a year ago.

What motivates an analyst to begin following a company? A new technology, the potential of the stock, a new development in a firm and a change in the size of the company were all factors.

The analysts' leading source of information about technology is the company officer, followed by trade publications, company scientific personnel, the financial press and various scientific journals, symposia and technical papers.

ACM Gets Rights From CII To Use Sensor Technology

GOLETA, Calif. – Applied Magnetics Corp. (AMC) has signed an agreement with Compagnie Internationale pour l'Informatique (CII) in Paris for the rights to CII's thin-film magnetic sensor technology.

The agreement gives AMC the right to use the technology as well as the proprietary process needed to manufacture the multiturn, thin-film electromagnetic sensors used in magnetic heads.

AMC will sell the product in the U.S., the Far East and Western Europe.

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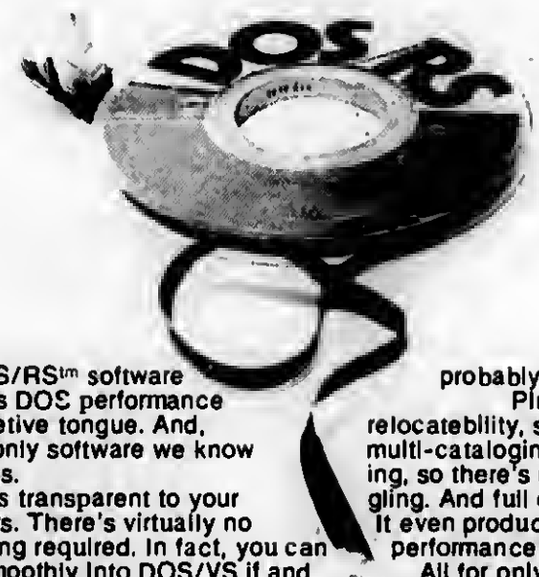
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CompDesign Takes OEMs on Spring Tour

NEWTON, Mass. – OEM suppliers will have an opportunity to display their products next spring at CompDesign/76, an OEM tour of Boston, New York, Chicago, Los Angeles and San Francisco.

The show will include designer forums, a product exposition and exhibitor product seminars.

The designer forums will consist of opening sessions with editorial material and remarks by *Computer Design* magazine, sponsor of the show. These remarks will be followed by concurrent workshops that cover subtopics of a daily theme.

The opening day's theme will be "Business Topics for the Computer Product Manager." The theme of each second day will be "Peripherals for Mini- and Microcomputers" and the third day will concentrate on microprocessors.

In addition, product seminars conducted by exhibitors will cover topics such as mini and microprocessor applications, switching power suppliers, software systems, test procedures and peripheral interface technology.

CompDesign/76 will join with the Computer Caravan in the five-city tour, sharing facilities and taking advantage of logistical and promotional economies.

The 1976 schedule includes Boston, March 2-4; New York, March 9-11; Chicago, April 13-15; Los Angeles, May 4-6; and San Francisco, May 11-13.

The tour is being managed by The Conference Company, 797 Washington St., 02160.

Del. Court to Hand DCC Injunction Barring Use of DG Logic Drawings

NEWCASTLE COUNTY, Del. – Chancellor William Marvel of the Delaware Chancery Court has ruled Digital Computer Control, Inc.'s (DCC) use of Data General Corp.'s (DG) maintenance logic drawings for the Nova 1200 in the design of DCC's D116 is improper.

When signed, the ruling will permanently enjoin DCC "from the use of Nova 1200 and D116 logic drawings for the purpose of manufacturing computers substantially identical to the Nova 1200."

DG initiated a suit against DCC in 1971 charging it with wrongful appropriation of proprietary information for use in manufacturing an identical product. In 1973 DG again filed against DCC, charging it with patent infringement on two counts.

The court indicated there will be a separate trial on damages. DCC said it believes such damages, if awarded, will not exceed $100,000.

DCC to Appeal

DCC President John N. Ackley said the firm intends to appeal the ruling immediately after the Chancery Court signs its order.

DCC expects to conduct "business as usual," Ackley said.

He pointed out DCC is not enjoined from manufacturing, since the logic drawings are not used in the manufacturing but in the design of the D116.

However, should the company be prevented in the immediate future from manufacturing the D116 or should an award of substantial damages be made, material adverse effects in future operations would result, DCC said.

'Trivial and Obvious'

DG has two patents on its Nova 1200, Ackley said. He termed "trivial and obvious" the one covering the duplication of accumulator memory.

The other patent covers a front panel switch circuit, which DCC does not employ in its D116.

The D116 accounts for a high portion of DCC's business, Ackley said, but this should change because the firm has several new products out.

Heads Named at STC, ACT Unit

Executive changes continue apace this fall, with Storage Technology Corp. (STC) naming a new president and Dick H. Brandon joining Advanced Computer Techniques (ACT).

Jesse I. Aweida, STC chairman and chief executive officer, has vacated the president's chair for Victor A. Casebolt, formerly general manager of General Electric's Utility & Process Automation and Instrument departments.

Two STC executive vice-presidents have left the firm: Gene Prince, in operations, and James Dutton, in field operations.

ACT has named Dick H. Brandon as head of the commercial sector of the firm, which will be consolidated in a separate organization, ACT-Brandon Co.

Brandon will be president and chief executive officer of the new unit and will also be a director of the parent company.

Brandon founded Brandon Applied Systems and most recently served as chairman of that firm.

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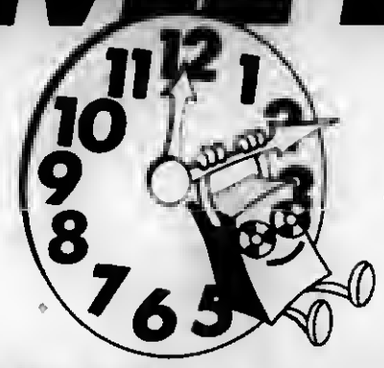
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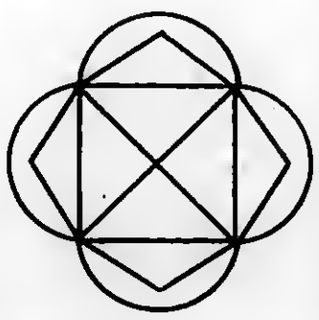


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At Data Disc

Trend to Hybrid Disks Seen Developing

By Molly Upton
Of the CW Staff

SUNNYVALE, Calif. – With IBM setting the pace, there should be increased movement toward hybrid fixed- and moving-head disks among disk makers, according to Esmond C. Lyons Jr., vice-president of marketing at Data Disc, Inc.

This could have a severe impact on fixed-head disk makers because it will reduce the cost but retain some of the advantages of fixed-head disks, such as quick access time and reliability, he said.



James Woo

The hybrid disk would either have one fixed-head disk and one moving-head disk, or part of one platter would be fixed-head and the other moving-head, Lyons explained.

A hybrid system would enable a user to get fixed-head capability for slightly more money, he said, rather than having to add a separate system for fixed-head disks.

It would be easier to put moving heads on fixed-head technology than vice versa, he observed.

In the past, the principal market for fixed-head disks has been process control, where reliability is critical, he said.

Pursuing POS Mart

Data Disc intends to pursue the point-of-sale (POS) market, James Woo, president, said.

The company intends to design a product for the POS marketplace, where systems are often located in non-DP environments but the need for reliability is great, Woo said.

In a reversal of the industry norm, the electromechanical parts of Data Disc's fixed-head drives are more reliable than the electronics, Lyons said.

Fixed-head disks are more reliable than moving-head disks because they are constantly rotating, eliminating the accelerations that cause wear on the electromechanical portion of moving-head disks, he explained.

Mean time between failure of fixed-head disks and controllers is somewhere around 14,000 hours, he said, compared with between 2,000 and 4,000 hours for moving-head disks.

Fixed-head disks are generally of smaller capacity and cost more than moving-head disks, he said.

Data Disc has almost total vertical integration of its products, Woo said, including the manufacture of heads.

About five years ago, the firm had a reputation for offering low-cost and somewhat lower quality products, Lyons said. That has changed completely now because Data Disc concentrates on quality technology, he said.

The firm also makes graphics displays, which account for about 15% of its business, the Bright line of rack-mountable tape drives, which account for about 20%; and video disks, which account for 10%, Lyons said. Disk drives are about 55% of the firm's business.

Just as its disk drives are the fixed-head type, its tape drives are vacuum column. Most of the drives for the mini market are tension arm, he observed.

Data Disc announced a 125 in./sec vacuum column drive last May which, Lyons said, was the top of the line of rack-mountable drives.

The Bright line offers a broad range of products including a high degree of commonality, which appeals to OEMs, he said.

Data Disc's tape drive line should grow faster than its disk line, Lyons said, but it is also starting from a smaller base.

The tape drives are becoming popular in computer output microfilm (COM) units, he said, because they are adaptable to either 7- or 9-track 1,600 bit/in. or NRZI formats, depending on which cards are inserted, he said.



CW Photos by M. Upton

Esmond C. Lyons Jr.

A service bureau offering COM needs to be able to accept a variety of tapes presented by users, he added.

Although the fixed-head disk drive market has about seven or eight competitors grappling for a total of about $50 million worth of business, there is not the price competitiveness there is in other fields, Lyons said.

He explained this is principally because of the emphasis on quality rather than price.

T-Bar Forms Division To OEM Its Switches

WILTON, Conn. – T-Bar, Inc. has formed an OEM products division for mainframe and minicomputer users of T-Bar computer switches.

The new facilities and services are expected to lead to increased sales for an expanded range of manufacturers through the availability of plug-compatible switching equipment which will bulk reconfigure computer outputs to a wide choice of printers, displays, memory banks, disk controllers and front ends, according to John Tobey, products manager.

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Shugart Expects 1976 Sales to Climb to $9 Million

By Molly Upton
Of the CW Staff

SUNNYVALE, Calif. – Shugart Associates sales for fiscal 1976 may climb to $9 million compared with $2.5 million in the year ended last April, President Donald J. Massaro said.

"The floppy market has opened up in the last seven months," he said, adding the firm expects its shipments to climb from 1,500 drive/mo last August to 2,000 drive/mo in November and 3,000 drive/mo in January.

By way of contrast, the firm shipped only 600 drives in June.

Shugart has about 60% of the independents' market share on an installed basis and hopes to maintain 40% of the independent base, he said.

Competitors

The floppy disk drive race is narrowing to three principal competitors, he said: Shugart, Control Data Corp. and Century Data Systems, a unit of California Computer Products, Inc. (Calcomp).

In observing that Shugart is the only single-produet firm among his list of the big three in the floppy disk field, Massaro said he would prefer that Shugart be known as the low-cost peripheral company.

Next Produet

The next product will be a low-cost disk drive, he said, which will complement the floppy. "We try to concentrate on one thing and do it well," he said, and he defined that area as inexpensive rotating memories.

Shugart has begun shipments of its double-density drive, which he said has the same error rate as that of the single-density drive.

The Shugart unit doubles the linear density, with the same number of tracks and uses the modified modified frequency-modulation technique (M^2FM).

'Streaker Kit'

The firm offers a "streaker kit," consisting of the double-density drive and the formatter board, he said.

With single-density, customers generally prefer to do their own formatting.

Massaro said he foresees storage capacity on a diskette of 2.5M bytes. The next step is using both sides. The normal IBM-compatible diskette holds 250,000 bytes, he added.

Shugart, he pointed out, has considerable technical expertise in the form of patent holders for the original IBM floppy, the M^2FM technique, and the diskette, he said. It also makes its own heads and holds patents in this area.

On the Ropes

Shugart was on the financial ropes last October, when top management was evicted and the in-house R&D program was halted.

But the firm has been profitable since March and has a balance sheet that looks good from a cash standpoint, Massaro said.

In addition, it now has a $1 million line of credit from Wells Fargo Bank that is untapped, he remarked.

Many changes were made in that reorganization. In October the firm had three buildings; it now occupies one and has subleased another one.

Currently the firm employs about 105 people, 70 of whom are in operations, he said. Shugart can produce 3,000 drive/mo on a one-shift basis, Massaro added.

His emphasis since taking over in October has been to get to the breakeven point and improve the balance sheet, he said.

Making More Money

One of his first steps was to put the salesmen on a strong commission plan. He expects each Shugart salesman to make "significantly more than I make" this year, he said.

Within the last four months, the firm has established a cash incentive plan for management and key employees and a stock bonus plan by which it gives stock to employees."

"There are a lot of carrots hanging around here," he said.

Orders are up to such an extent that delivery time is getting to be around 60 days, he said. Delivery time used to be "when can I bring it over," Massaro added.

Direct sales account for about 95% of U.S. business, and Shugart is establishing a direct sales force in Europe, which will also use distributors.

It has distributors in England, Scandinavia as well as Japan. Shugart also licenses Matsushita to build its drives, he said.

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Jerry Weinberg—author of The Psychology of Computer Programming, An Introduction to General Systems Thinking and co-author of Structured Programming in PL/C. Jerry will speak on programming teams, structured walkthroughs and other related topics.

Larry Constantine—co-author of "Structured Design" in the IBM Systems Journal and co-author of Structured Design. Larry will speak on structured design and its impact on structured programming.

Bill Plauger—co-author with Brian Kernighan of The Elements of Programming Style, "Programming Style" "Examples and Counter-Examples" from the ACM Computing Surveys special issue on programming, and the soon to be published Software Tools. Bill will speak on programming style and will emphasize that eliminating GOTO statements does not ensure a readable program.

Tom Plum—co-author of "IF-THEN-ELSE Considered Harmful, "Teaching Structured Programming...by Example," and "Remedial Programming." Tom will serve primarily as moderator.

Ed Yourdon—author of Design of On-Line Computer Systems, Techniques of Program Structure and Design, and co-author of Structured Design. Ed will discuss the practical problems of implementing structured programming and the associated "programmer productivity techniques" in the typical EDP organization.

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Printer Activity Abounds

There's a lot of activity in the printer area, judging from the quantity of news releases about printers and the admissions and indirect intimations of manufacturers planning to enter the printer business with units of their own design.

DOC 2250 Prints 2,250 Line/Min

MELBOURNE, Fla. – The latest entrant into the printer business is Documation, Inc., known for its card products, which has come out with the DOC 2250 impact line printer.

The unit prints up to 2,250 line/min with 132 print positions, single-spaced, using a 48-character set, for a price of $32,500 in single orders. Documation will sell the printer on an OEM basis.

Being in the printer business is a result of the firm's intention to expand in various areas of automated document handling, a spokesman said.

Documation makes its own print mechanism and developed the controller microprocessor, which communicates through its interface with the host system, decodes commands, controls the printer hardware and reports various errors and status, the firm said.

The DOC 2250 can handle up to six-part forms, with forms ranging from 3 in. to 24 in. length and has a paper slew rate up to 100 in./sec, the firm said.

Other standard features include: fully buffered print line, interchangeable character arrays and a universal character set buffer that allows any character set to be used, according to Documation.

A vertical forms-control buffer handles various forms sizes and determines either 6- or 8 line/in. A powered forms stacker is also included, as well as an acoustically insulated cover. There are resident microdiagnostics and maintenance is independent of the host system, the firm said.

Deliveries of the DOC 2250 are scheduled to begin in the second quarter. The firm can be reached through Box 1240, 32901.

Dataproducts OEMs Components

WOODLAND HILLS, Calif. – Dataproducts Corp. has formed a unit for OEM sales of components, including the Mark IV print hammers, hammerbanks and Charaband, a horizontal font carrier.

The Components Management sector will be headed by Royce Lacey, director, who will report to Robert J. Pieper, vice-president of product management and support services.

The firm also formed a New Business Development organization, with Richard Ericson, vice-president, leading the effort to seek new business opportunities outside the company's present product line.

During the fall, Dataproducts restructured its marketing division in a move to reorganize part of the company along functional lines.

The product management of line printers was transferred from an operational profit-and-loss division to the Marketing Division and combined with customer service, technical support, and promotional activities, according to the firm.

Dataproducts said it has begun volume deliveries of line printers to Decision Data Computer Corp., which is marketing the printers with compatible interfaces to the IBM System/3.

Centronics Gets Print Head License

CROTON FALLS, N.Y. – Centronics Data Computer Corp. has been granted a nonexclusive license by the Matschke General Research Co., Inc. here on its wire dot matrix print heads, according to General Research.



DOC 2250 Printer

The head is said to do "substantially more work" than the typical solenoid head and uses a "Z-rack" electromagnetic print component.

General Research plans to develop additional heads and to introduce next year its "D-Cell" electromagnetic print mechanism designed for general use with particular adaptation to serial communications work.

General Research can be reached through Box 577, 10519.

Centronics has established its second European subsidiary in West Germany, Centronics Data Computer GmbH. The move follows the dissolution of distributor arrangements with Core Computer.

Study Finds

DP Accepting Matrix Printing

WALTHAM, Mass. – "Matrix characters, composed of various combinations of dots, have gained rapid acceptance by the data processing industry," observed Fred Anderson, project manager for a study conducted by International Data Corp. (IDC).

Most mainframe manufacturers and scores of peripherals firms are offering at least one model of matrix printer, he added.

There is a possibility matrix character recognition (MCR) equipment may one day provide an alternative to more expensive optical character recognition (OCR) equipment, he suggested.

"Unlike currently available readers, the logic involved in the recognition of matrix characters would simply be the opposite of that used to generate the characters – dots would be sensed rather than printed.

"Further, the cost of MCR devices might conceivably be in the range of available matrix printers – only several thousand dollars vs. tens of thousands," Anderson said.

The IDC study reviewed matrix printer technology, looked at vendor strengths and weaknesses and estimated the size and growth of the market as well as possible approaches to matrix recognition.

Firms to Use Matrix Printers

As an example of the firms that have announced plans to use matrix printers, IBM's 3767 communications terminal will print up to 120 char./sec and join other matrix priners offered as part of the System/32, 3/6, 3270, 3600, 3650, 3740 and 3770 systems, IDC said.

Burroughs TC 5100s will use a 60 char./sec matrix console printer and GE offers a 30 char./sec matrix terminal with optional keyboard.

In addition, Tally has agreed in principle to partially manufacture and market a 120 char./sec matrix printer designed by Information Systems Italia. Logabax has opened a U.S. sales office, in addition to relying on marketing agreements with Sycor, Inc. and Control Data Corp., IDC said.

Singer Names Flavin President

NEW YORK – Changes have been happening throughout the ranks of Singer Corp. and its Business Machines Division at a fast and furious pace.

Starting at the top, Joseph B. Flavin replaced Donald P. Kircher as president, chief executive and chairman as of Dec. 1.

Flavin was executive vice-president of international operations at Xerox Corp. and a director of that firm.

Kircher is resigning because of health reasons, Singer said.

George R. Cogar replaced Richard O. Baily as president of Singer Business Machines Division. Cogar was president of Cogar Corp., a Singer subsidiary.

In making the appointment, Edwin J. Graf, chief operating officer, said "We're going to concentrate our resources and marketing efforts on the growing retail and terminal systems market. This permits us to capitalize on our strengths and allows us to cut overhead and other support expenses."

The immediate aim is to improve the division's performance as well as that of the total company, Graf said.

Answering charges Singer has been trying to sell its Business Machines Division, Graf avowed the firm intends to "roll up our sleeves and make it profitable."

Although the firm does not discuss divestments without specific developments, Graf said Singer would be realistic on the question of possible divestment.

Major Step

Cogar's appointment and the improvement program constitute "a major step in our action plan to put Singer back on the profit track," Graf said.

Cogar, who has been unavailable for comments to the press, has named Otto Stitz senior vice-president of international operations for the Business Machines Division.

The position supersedes that of vice-president of international marketing, formerly held by F. Gordon Smith.

BCS Names Auerbach Fellow

LONDON – Isaac L. Auerbach, president of the Auerbach Corp. for Science and Technology and its subsidiaries was elected distinguished fellow of the British Computer Society (BCS).

Distinguished fellow is the society's highest honor and has been awarded to only nine recipents in the 20 years of the society's existence. Auerbach received the award in recognition of his contributions to the development of the computer and for his leadership in founding and serving for six years as the first president of the International Federation for Information Processing.



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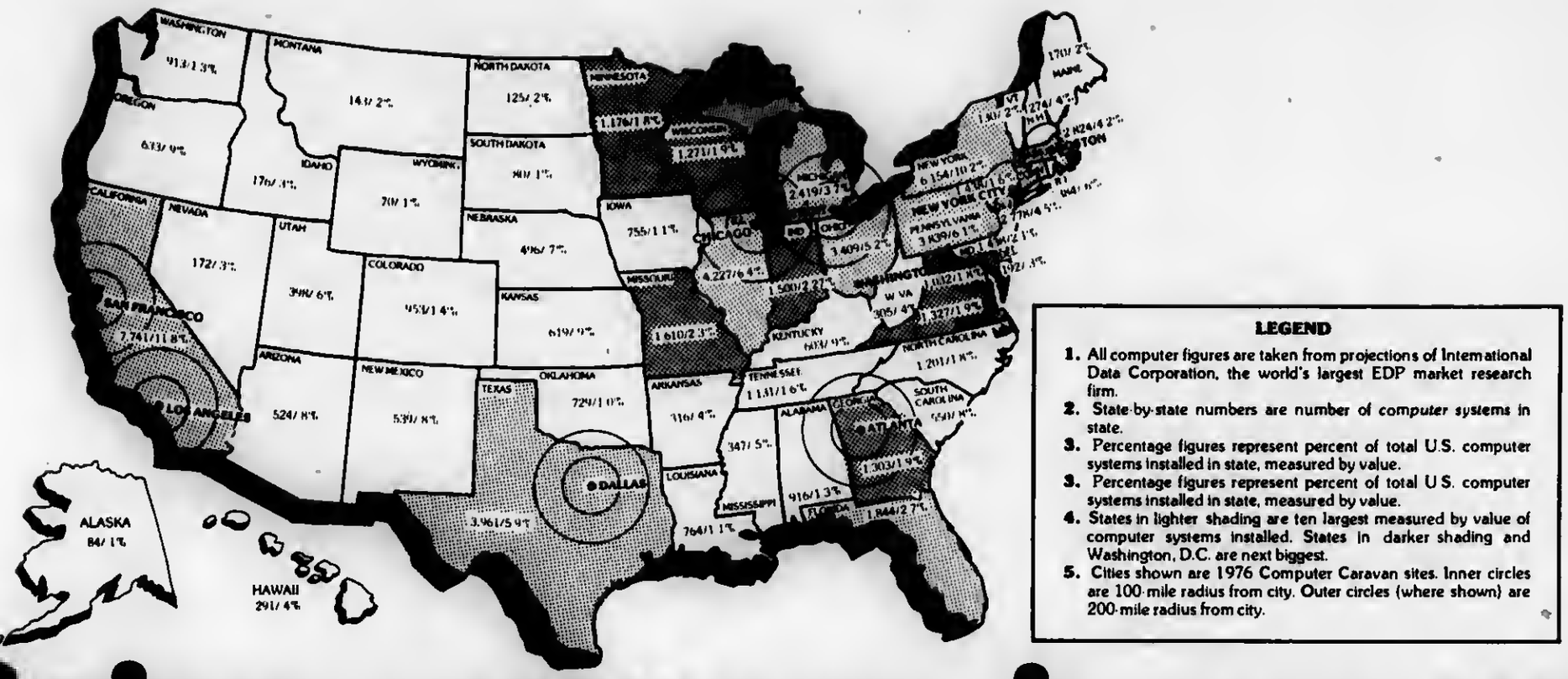
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LEGEND

1. All computer figures are taken from projections of International Data Corporation, the world's largest EDP market research firm.
2. State-by-state numbers are number of computer systems in state.
3. Percentage figures represent percent of total U.S. computer systems installed in state, measured by value.
3. Percentage figures represent percent of total U.S. computer systems installed in state, measured by value.
4. States in lighter shading are ten largest measured by value of computer systems installed. States in darker shading and Washington, D.C. are next biggest.
5. Cities shown are 1976 Computer Caravan sites. Inner circles are 100-mile radius from city. Outer circles (where shown) are 200-mile radius from city.

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DP Stocks Make Wema Top 10

MONTEREY, Calif. – Several firms in the DP industry were listed among the top 10 stocks of the Western Electronics Manufacturers Associations' (Wema) 53 members as ranked by an institutional brokerage firm.

The Wema stocks as a group outperformed those of the Standard and Poors' 500 listing in several respects.

Among the 10 strongest firms in terms of relative strength were Intel Corp., Advanced Memory System, Microdata Corp., Computer Automation, Inc. and Tymshare, Inc. The relative strength is determined by calculating price changes during the past year, with more weight given for the recent three months.

Overall, the 53 Wema stocks had an average projected increase in either current or 1976 earnings of 17%, whereas the Standard and Poors average estimated increase was only 1%, according to William O'Neil, chairman of William O'Neil & Co., a Los Angeles-based firm which provided the computer-generated analyses of the Wema stocks.

According to a Datagraph rating, a system used by O'Neil, Intel, Tymshare, Microdata, Information International, Inc. and Centronics Data Computer were among the top 10. The Datagraph rating incorporates several elements that may influence stock prices and assigns weightings to reported earnings, capitalization and other factors.

The average increase in earnings by Wema firms for the past 12 months was 6%, compared with 2% for the Standard and Poors 500, O'Neil said.

However, the Standard and Poors 500 showed a stronger stability level for earnings, he added.

In terms of industry ranking, 94% of the Wema stocks were in the top half of their industry according to relative strength, the study showed.

But the firms had an average decline of 2% in the latest quarter sales, whereas the Standard and Poors 500 showed a 6% gain.

The average earnings of the Wema stocks was 1.2% compared with 4.9% for the Standard and Poors group.

Executive Corner

- Jarvis J. Slade has been elected president of Computer Investors Group, Inc.
- R.C. Phillips has been named vice-president of the systems division in Univac's development and manufacturing organization.
- Robert M. Morrill has been named vice-president of marketing operations for Prime Computer, Inc.
- Richard A. Berreth, Charles A. Dickenson and J.P. Wilson have been appointed vice-presidents of Magnetic Peripherals, Inc.
- John F. Flood has resigned as president of Standard Memories, Inc. but will remain on the board of directors. Thomas W. Russel will serve as president of the company and continue his duties as group vice-president of Applied Magnetics Corp.
- J. Edward McAteer has been elected president and chief executive officer of Action Communication Systems, Inc. following the resignation of Dan A. Hosage as president of the company and its foreign subsidiary.

Correction

Douglas A. Davidson was vice-president, national accounts, at Honeywell prior to his departure for Mohawk Data Sciences [CW, Oct. 15].

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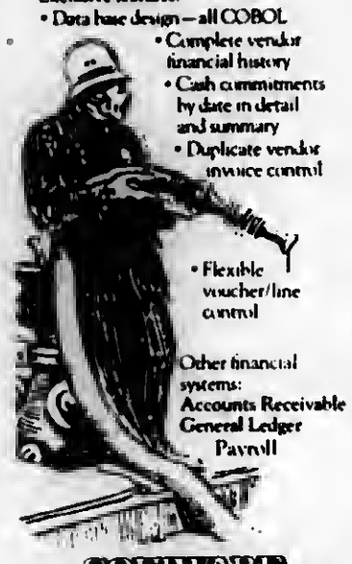
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But Flat Year Possible

Pertec Earnings Double in First Quarter

EL SEGUNDO, Calif. – Shortly after telling shareholders Pertec Corp.'s earnings more than doubled in the first quarter, President Ryal R. Poppa warned them the firm could experience a year of flat to slightly declining earnings.

In a previous speech, Poppa indicated Pertec intends to achieve annual revenues of $200 million by 1979, which is double the figure formerly mentioned by him.

The $200 million figure depends on successful completion of the proposed merger of Computer Machinery Corp. (CMC) into Pertec, which will give the firm end-user marketing capability, he told San Francisco analysts.

The Peripheral Equipment Division had "an outstanding quarter," exceeding revenue and profit targets, but the Business Systems Division (BSD) fell short of its objectives, he told shareholders.

Pertec is preparing for the possibility of a "significant downturn in sales in the BSD in the third and fourth quarters," Poppa said, following the decision by one of BSD's major customers to emphasize rerental of equipment.

"This situation dramatically illustrates the desirability for us to begin selling to the end-user market so as to better control our future destiny.

Quarter Net Up

For the first quarter, Pertec's earnings jumped to $874,000 or 27 cents a share compared with $341,000 or 11 cents a share in the year-ago period.

Revenues for the quarter rose to $12.5 million compared with $10 million in the same period last year.

Order rates for the Peripheral Equipment Division have shown a marked increase in the past couple of months, Poppa said, and contracts with Interdata and Digital Equipment Corp. have added to the backlog.

But at BSD, he said, order rates were down and firm delivery schedules for larger customers in the third and fourth quarter timeframe are down substantially.

CA Sets Records in Three Months

IRVINE, Calif. – Computer Automation, Inc. (CA) reported record sales income for the first quarter, signaling an end to the relatively flat performance that characterized the recessionary year of fiscal 1975.

The minicomputer company posted earnings of $591,573 or 31 cents a share and revenues of $6.6 million for the quarter ended Sept. 28.

Earnings for the quarter tripled the $195,288 or 12 cents a share reported for last. year's first quarter, while this year's revenues were 28% higher than last year's $5.1 million.

President D.H. Methvin said pretax income for the first quarter was $1.2 million, or about 18% of sales, compared with last year's pretax income of $390,575, or 7.5% of sales.

Although shipments of minicomputers during the first quarter accelerated to fill customer inventories depleted by the recessionary slowdown in capital equipment manufacturing, Methvin noted backlog still rose to $11.5 million, up 15% from the $10 million reported at the end of fiscal 1975 on June 29.

Bookings for the quarter were double those of a year ago, he said.

Methvin attributed this quarter's record performance to continuous, across-the-board increases in order rates for all of the company's current product lines, including automated logic module tester systems as well as its family of minicomputers, from both new and old customers.

Many of the newcomers were attracted by recent introductions of minicomputers priced as low as $395, Methvin said. But manufacturers who are resuming volume production of such computerized products as automated banking systems, and industrial control systems are largely responsible for the firm's increased sales, and Methvin said he expects the trend to continue.

Prime Quarter Revenues Rise 70%, Earnings Continue for Nine Months

FRAMINGHAM, Mass. – Prime Computer, Inc. reported its fourth consecutive profitable quarter as third-quarter revenues rose 70% above those of the year-ago quarter.

Revenues for the three months ended Sept. 28 totaled nearly $3 million compared with $1.8 million in the year-ago period.

Earnings rose to $202,101 or 10 cents a share, including an $111,700 tax credit, compared with a loss of $139,295 in the third quarter of 1974.

Revenues Rise

For the nine months, revenues reached $7.9 million compared with almost $4.5 million for the year-ago period.

Prime's nine-month earnings totaled $410,817 or 20 cents a share, including a $211,700 tax credit, compared with a loss of $546,375 in the same period last year.

President Kenneth G. Fisher said he was encouraged with the significant increase in sales and profitability over the corresponding period last year.

He attributed the gains to increased sales in both domestic and overseas operations coupled with a continuing emphasis on increased manufacturing productivity.

Increased Credit

Prime has increased its revolving credit line with the First Pennsylvania Bank by $2.5 million, bringing the total credit line to $7 million, which expires Dec. 31, 1977.

"We estimate this increase in our line of credit will give Prime sufficient sources of external financing to meet its needs through 1976," Fisher said.

Itel Earnings Dip in Nine Months

SAN FRANCISCO – Although Itel Corp.'s earnings for the third quarter and nine months were below those of the year-ago periods, the firm expects to match or surpass its record results of last year.

For the quarter, earnings were $2.7 million or 33 cents a share compared with $2.8 million or 32 cents a share in the year-ago period, when there was a $100,000 tax credit.

Revenues climbed to $58.2 million compared with $35.5 million in the year-ago period.

For the nine months, earnings dipped to $6.5 million or 76 cents a share compared with $7.3 million or 82 cents in the year-ago period, when there was a $400,000 tax credit.

Revenues grew to $139.1 million compared with $104.5 million in the same period last year.

Itel President Peter S. Redfield observed the third-quarter results exceeded those of the preceding second quarter.

"These results reflect the continued strong performance of our Data Products Group which, during the third quarter, completed a significant transaction involving a sale of computer peripheral equipment on operating lease with the Federal government," he said.

"We continue to expect excellent results for the fourth quarter and that Itel will be able to match or surpass the record results reported for last year," he said.

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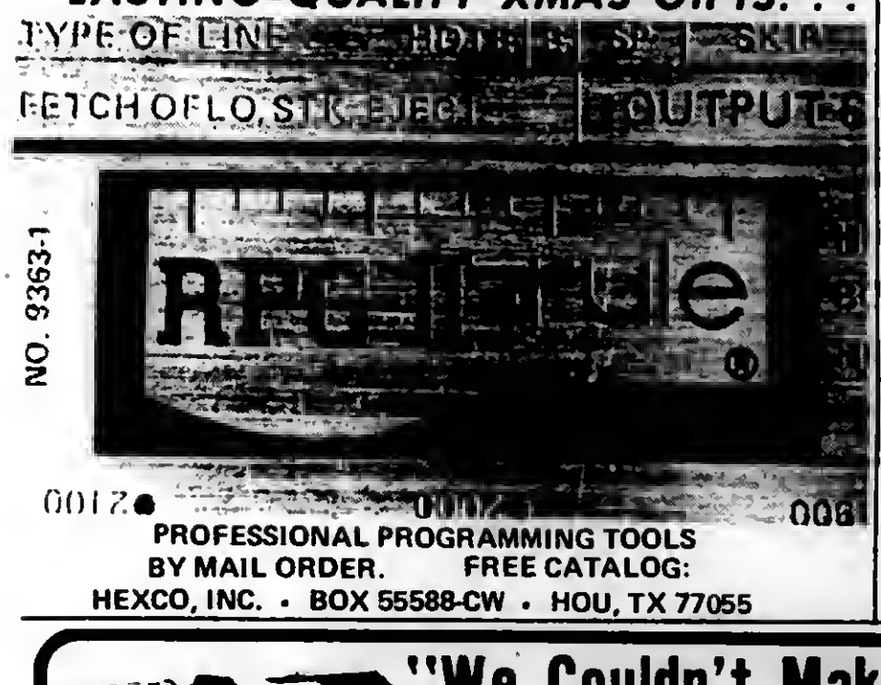
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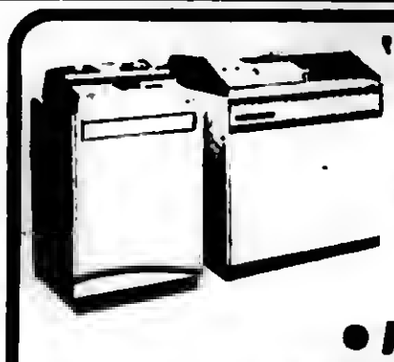
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Earnings Reports

COMPUGRAPHIC
Year Ended Sept. 27

	1975	1974
Shr Ernd	$3.16	$2.62
Revenue	74,404,000	61,413,000
Earnings	5,841,000	4,804,000
3 Mo Shr	.81	.66
Revenue	18,552,000	15,565,000
Earnings	1,518,000	1,201,000

THE COMPUTER EXCHANGE
Year Ended June 30

	1975	1974
Shr Ernd	$.30	.....
Revenue	4,043,860	$5,511,435
Earnings	207,676	(156,742)

AUTOMATIC DATA PROCESSING
Three Months Ended Sept. 30

	1975	a1974
Shr Ernd	$.51	$.41
Revenue	41,283,000	34,575,000
Earnings	3,589,000	2,885,000

a-Restated.

DIGITAL EQUIPMENT
Three Months Ended Sept. 27

	1975	1974
Shr Ernd	$.95	$.63
Revenue	140,458,000	111,753,000
Earnings	11,390,000	7,488,000

DATA 100
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.51	$.43
Revenue	24,638,000	18,195,000
Tax Cred	780,000	547,000
Earnings	1,847,000	1,307,000
9 Mo Shr	1.35	1.06
Revenue	67,996,000	48,097,000
Tax Cred	2,038,000	1,334,000
Earnings	4,840,000	3,240,000

ADVANCED MEMORY SYSTEMS
Year Ended Sept. 26

	1975	1974
Shr Ernd	$.90	.....
Revenue	32,015,000	$32,457,000
Tax Cred	1,100,000	.....
Earnings	2,291,000	(2,119,000)
3 Mo Shr	.34	.....
Revenue	8,811,000	7,592,000
Spec Item	e424,000	(14,000)
Earnings	881,000	(2,149,000)

e-Tax-loss carryforward.

HAZELTINE
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.24	$.07
Revenue	22,401,000	20,193,000
Earnings	a457,000	140,000
9 Mo Shr	.....	.17
Revenue	60,707,000	71,097,000
Spec Chg	.....	b680,000
Earnings	e(908,000)	354,000

a-Includes $94,000 gain on sale of an investment. b-Cumulative effect of accounting change.

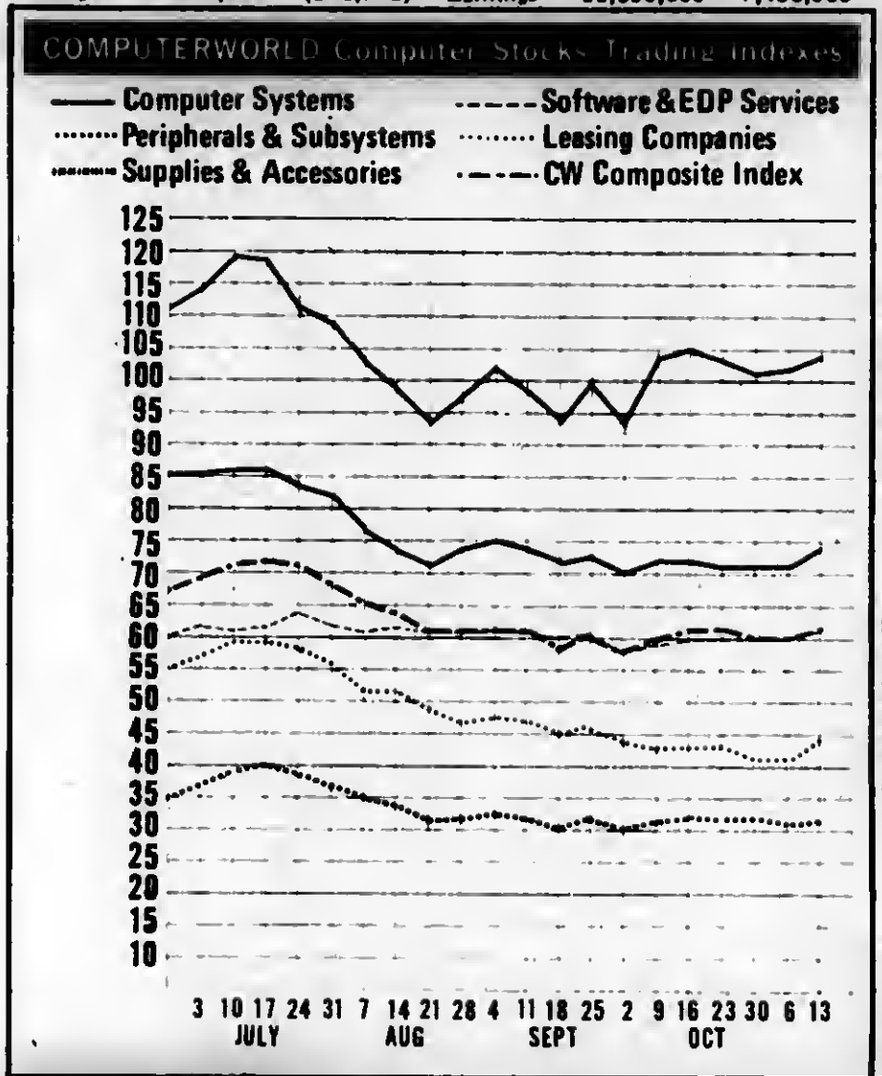
COMPUTER DIMENSIONS
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.21	$.15
Revenue	2,978,771	2,752,569
Disc Op	.....	(28,600)
Tax Cred	152,700	113,555
Earnings	333,688	231,657
9 Mo Shr	.46	.28
Revenue	8,474,789	7,477,169
Disc Op	.....	(54,919)
Tax Cred	341,900	211,305
Earnings	717,691	431,824

DATA DISC
Three Months Ended Oct. 3

	1975	1974
Shr Ernd	.....	$.01
Revenue	$1,966,000	2,576,000
Earnings	9,000	6,000
9 Mo Shr	.....	.20
Revenue	5,465,000	7,526,000
Earnings	(57,000)	201,000

COMPUTERWORLD Computer Stocks Trading Indexes



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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, NOVEMBER 12, 1975

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

E x C h		1975 RANGE 111	CLOSE NOV 12 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	ELXSI CORP	62- 100	79 3/4	-3 1/4	-3.9
C	COMPUTER AUTOMATION	2- 10	10	0	0.0
A	CONTROL DATA CORP	11- 23	19 3/8	- 3/8	-1.8
A	DATA GENERAL CORP	10- 39	39	+3 7/8	+11.0
C	DATAPOINT CORP	6- 26	25 1/2	+1 1/4	+5.1
C	DIGITAL COMP CONTROL	1- 4	2 1/4	- 1/4	-10.0
N	DIGITAL EQUIPMENT	46-140	135 5/8	+10 7/8	+8.4
A	ELECTRONIC MODULE	2- 3	2 1/2	+ 1/8	+5.2
A	ELECTRONIC ENGINEER.	5- 10	7 1/2	-1 1/8	-13.0
A	FOXBORO	23- 42	28	+ 3/8	+1.3
D	GENERAL AUTOMATION	4- 14	5 1/2	+ 1/4	+4.7
C	GRI COMPUTER CORP	1- 1	5/8	0	0.0
A	HEWLETT-PACKARD CO	98-120	103 3/8	+2 7/8	+2.8
A	HONEYWELL INC	22- 40	35 1/4	+1 1/4	+3.6
A	IBM	158-225	224 3/4	+9	+4.1
C	MEMOREX	1- 10	8 1/2	- 1/8	-1.4
D	MICRODATA CORP	2- 7	7 1/8	+1	+16.3
C	MODULAR COMPUTER SYS	5- 19	11 1/2	+2	+21.0
A	NCR	15- 39	24 1/4	- 1/2	-2.0
C	PRIME COMPUTER INC	2- 6	4 3/4	0	0.0
A	PERKIN-ELMER	16- 30	25	- 3/8	-1.4
N	RAYTHEON CO	26- 59	48 3/8	0	0.0
A	SINGER COMPANY	9- 17	10	- 1/8	-1.2
A	SPERRY RAND	26- 49	44	+ 1/8	+0.2
A	SYSTEMS ENG. LABS	1- 5	5	0	0.0
A	VARIAN ASSOCIATES	7- 18	13 3/4	- 1/4	-1.7
A	WANG LABS.	7- 17	11 5/8	+ 1/2	+4.4
A	XEROX CORP	51- 86	56 5/8	+ 3/4	+1.3
	LEASING COMPANIES				
C	COMDISCO INC	1- 5	3 3/8	+ 3/4	+28.5
A	COMMERCE GROUP CORP	2- 4	2 3/8	- 1/8	-5.0
A	COMPUTER INVSTRS GRP	1- 2	5/8	+	+10.0
M	CATERAIR RENTAL	1- 1	1/2	0	0.0
A	CCL INC	0- 1	3/8	0	0.0
N	DPF INC	5- 8	4 3/8	0	0.0
C	ECF RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/8	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 5/8	+ 1/8	+5.0
N	ITEL	3- 9	6 3/8	- 1/8	-1.9
P	LEASCO CORP	4- 8	5 5/8	- 7/8	-13.4
C	LEASPAC CORP	1- 1	1/4	+ 1/8	+100.0
C	LECTRO MGT INC	1- 1	1/8	0	0.0
C	NMG INC	0- 4	1/2	- 1/8	-20.0
A	PIONEER TER CORP	2- 7	5 1/4	- 1/4	-4.5
P	RECOGNITION COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	8	+ 1/4	+3.2

E x C h		1975 RANGE 111	CLOSE NOV 12 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
C	ADVANCED COMP TECH	1- 1	1	0	0.0
A	APPLIED DATA RES.	1- 10	1 1/4	- 1/4	-16.6
N	AUTOMATIC DATA PROC	29- 65	54 1/4	+3 1/4	+5.8
C	BRANDON APPLIED SYST	1- 1	1/4	+ 1/8	+100.0
C	COMPUTER DIMENSIONS	2- 6	3 1/2	+ 1/2	+16.6
C	COMP EFFICIEN SYSTMS	3- 7	6 3/4	- 1/4	-3.5
C	COMPUTER HORIZONS	1- 1	5/8	- 1/8	-16.6
C	COMPUTER NETWORK	1- 3	3 1/8	0	0.0
A	COMPUTER SCIENCES	2- 6	4 1/2	- 1/8	-2.7
C	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
C	COMPUTER USAGE	2- 4	2 3/8	+ 1/4	+11.7
C	COMSHARE	3- 4	3 1/8	+ 3/8	+13.6
C	CRYSTAL	1- 2	3/4	- 1/8	-14.2
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	13 1/4	+1 1/4	+10.4
C	INFORMATIONAL INC	1- 1	1/8	0	0.0
C	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
C	KEANE ASSOCIATES	2- 3	2 1/2	0	0.0
C	KEYDATA CORP	2- 3	2 1/4	+ 1/4	+13.3
C	LOGICON	3- 5	3 3/8	- 1/8	-3.5
A	MANAGEMENT DATA	1- 3	1 5/8	- 1/8	-7.1
A	NATIONAL CSS INC	6- 14	10 3/8	0	0.0
C	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	14 1/2	+ 5/8	+4.5
N	PLANNING RESEARCH	2- 6	3 3/8	- 3/8	-10.0
C	PROGRAMMING & SYS	1- 1	5/8	0	0.0
C	RAPICATA INC	2- 5	3 3/8	+ 1/2	+17.3
C	REYNOLDS & REYNOLD	10- 24	17	+1 1/2	+5.6
C	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
C	SIMPLICITY COMPUTER	1- 1	1 1/8	0	0.0
C	TYMSHARE INC	7- 21	19 5/8	- 1/4	-1.2
A	UMS SYSTEMS	2- 4	3 1/8	- 3/8	-10.7
N	WYLY CORP	2- 4	3	- 1/8	-4.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULTI	4- 9	7 7/8	+ 1/8	+1.6
C	ADVANCED MEMORY SYS	1- 7	4 7/8	- 1/4	-4.6
N	AMEX CORP	3- 7	5 3/4	+ 5/8	+12.1
C	ANDERSON JACOBSON	1- 3	2 1/8	0	0.0
C	BEEHIVE MEDICAL ELEC	1- 5	3	- 1/8	-4.0
A	BOLT,BERANEK & NEW	5- 13	8 1/8	+1 1/4	+18.1
N	BUNKER-RAMO	4- 8	4	- 1/8	-3.0
A	CALCOMP	4- 7	3 5/8	+ 1/8	+3.5
C	CARPENTER TECHNOLOGY	2- 5	1 7/8	- 3/8	-16.6
N	CENTRONICS DATA COMP	7- 25	18 1/8	- 1/8	-0.6
C	CODEX CORP	15- 38	36 3/4	+2 3/4	+8.0
C	COGNITRONICS	1- 2	3/4	- 1/8	-14.2
C	COMPUTER COMMUN.	1- 2	7/8	0	0.0
C	COMPUTER CONSOLES	3- 7	3 3/4	+ 1/2	+15.3
A	COMPUTER EQUIPMENT	1- 2	1 1/2	- 1/8	-7.6
C	COMPUTER MACHINERY	1- 2	7/8	0	0.0
C	COMPUTER TRANSCEIVER	1- 2	7/8	- 1/8	-12.5
C	COMTEN	2- 5	3 1/4	- 3/8	-10.3
N	COMRAC CORP	12- 27	24 3/4	-2	-7.4
C	DATA ACCESS SYSTEMS	1- 3	1 3/4	+ 1/2	+40.0
C	DATA 100	5- 16	9 7/8	+ 1/2	+5.3
A	DATA PRODUCTS CORP	2- 6	4 1/8	- 1/4	-5.7
C	DATA TECHNOLOGY	1- 3	1 1/8	- 1/4	-18.1
C	DATUM INC	1- 2	7/8	0	0.0
C	DECISION DATA COMPUT	3- 7	2 7/8	- 3/8	-11.5
C	DELTA DATA SYSTEMS	1- 1	1/4	+ 1/8	+100.0
C	DIGI-DATA CORP	1- 1	3/4	0	0.0
A	ELECTRONIC M & M	1- 3	1 1/4	- 1/8	-9.0
C	FARRI-TEK	1- 1	3/4	0	0.0
C	GENERAL COMPUTER SYS	1- 2	1	- 1/4	-20.0
N	HAZELTINE CORP	3- 6	3 1/2	0	0.0
N	HARRIS CORP	18- 32	32	+1 1/4	+4.0
A	INCOTERM CORP	3- 12	4 1/8	- 3/4	-7.5
C	INFOREX INC	2- 5	3 1/8	+ 5/8	+25.0
C	INFORMATION INTL INC	8- 14	12 1/2	0	0.0
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
C	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	MILGO ELECTRONICS	8- 24	17	+1 3/4	+11.4
N	MOHAWK DATA SCI	1- 5	3 1/8	0	0.0
C	OPTICAL SCANNING	1- 3	2 5/8	0	0.0
C	PERRIL CORP	2- 2	1 1/4	0	0.0
C	PERTEC CORP	2- 8	4	0	0.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
C	PRECISION INST.	1- 1	3/8	+ 1/8	+50.0
C	QUANTOR CORP	2- 6	4 3/4	+1 1/4	+35.7
C	RECOGNITION EQUIP	2- 9	6 3/8	0	0.0
N	SANDERS ASSOCIATES	5- 11	7 7/8	- 5/8	-7.3
C	SCAN DATA	1- 3	1 3/8	+ 1/8	+10.0
C	STORAGE TECHNOLOGY	6- 17	11 1/2	- 1/2	-4.1
C	SYCOR INC	5- 22	22 1/4	+5	+28.9
C	T BAR INC	3- 6	6 1/4	0	0.0
C	TALLY CORP.	1- 5	2 3/8	- 5/8	-20.8
C	TEC INC	1- 4	2 1/2	- 1/4	-9.0
N	TEKTRONIX INC	18- 43	42 1/2	+1 1/8	+2.7
N	TELEX	1- 3	2 1/8	0	0.0
C	WANGCO INC	4- 9	6 7/8	0	0.0
C	WILTEK INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
C	BALTIMORE BUS FORMS	4- 5	4 1/4	- 1/4	-5.5
A	BARRY-WRIGHT	5- 7	5 3/4	+ 1/4	+4.5
C	CYBERNATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	32 1/4	+ 3/4	+2.3
C	DUPLEX PRODUCTS INC	12- 25	17 3/8	+2	+13.0
P	ENNIS BUS. FORMS	5- 7	5 3/8	+ 1/4	+4.8
C	GRAHAM MAGNETICS	5- 10	9	+ 3/4	+9.0
C	GRAPHIC CONTROLS	8- 21	13 1/4	+ 3/4	+6.0
N	3M COMPANY	43- 68	60 1/8	+2 7/8	+5.0
C	MOORE CORP LTD	35- 51	47 3/4	+2 1/2	+5.5
N	NASHUA CORP	9- 22	10 7/8	- 1/8	-1.1
C	STANDARD REGISTER	11- 20	15 3/4	+ 1/4	+1.6
C	TAB PRODUCTS CO	4- 8	5	0	0.0
N	UARCO	17- 24	21 1/8	+1 3/8	+6.9
C	VARIER GRAPHICS CORP	4- 7	4 1/2	+ 1/4	+5.8
A	WEBAG MAGNETICS	3- 5	3 7/8	- 1/8	-3.1
N	WALLACE BUS FORMS	15- 25	17	+ 3/4	+4.6

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Datapro as reported in Computerworld, p.14, Jan. 22.

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The 'Typical' Network User

By Ronald A. Frank
Of the CW Staff

NEWTON, Mass. – The "typical" network user operales a regional data communications net including a mix of CRTs, remote batch and interactive terminals and utilizes either dial-up or private lines.

The lines usually come from the telephone company and the hardware – including modems, CPU and terminals – is supplied by about four different vendors. The transmission speed of the network is probably 1,200-, 2,400- or 4,800 bit/sec and the biggest problem is maintaining line quality.

This is a snapshot of the 128 network users who responded to the recent *Computerworld* network survey [CW, Nov. 5]. Applications ranged all the way from small companies configuring their first network with one remote batch terminal to operators of international time-sharing nets.

Communications is definitely a multivendor domain, the survey found; eight users said they have 10 or more different suppliers. Twenty-one said they are being served by four vendors for their equipment, and another 21 said they have two vendors, which probahly includes both a hardware supplier and a carrier.

Twenty-one users said they utilize specialized common carriers in their net and most of these also have telephone facilities. Some of these phone company lines are probably used for local loops. The majority rely on the phone company, with 99 having only one carrier. Surprisingly, Western Union was classified as a specialized carrier hy ahout six users.

CW Special Report on "Unraveling Data Networks" follows Page 22.

The most popular transmission speed appears to be 4,800 bit/sec (43 users) with 2,400 bit/sec running a close second (38 users). Twenty-eight users said they operate at 1,200 bit/sec while only 18 said they use 9,600 bit/sec.

(Continued on Page 4)

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NEWSPAPER



Turmoil Touches IBM

Even IBM has been touched by the current political turmoil in Portugal. See story on Page 5.

Concerned About Security

Law Officials Balk at DP Sharing

By Naney French
Of the CW Staff

WASHINGTON, D.C. – Law Enforcement officials expressed the concern here last week that shared rather than dedicated computer systems might pose security and service problems.

Testifying at hearings conducted by the Law Enforcement Assistance Administration (LEAA), Adam D'Allessandro, deputy director of New York State's division of criminal justice services, said computer people have assured him they can provide a system secure from penetration hy unauthorized persons.

But such shared systems must be looked at "with a jaundiced eye," he said.

D'Allessandro acknowledged, however, that economic considerations left many law enforcement agencies little choice hut to share. In such cases, according to D'Allessandro, "control" over the entire system should remain with law enforcement officials.

The hearings were held to give law enforcement officials and the public an opportunity to comment on the proposed rule change amending the requirements for dedicated computers for criminal justice information systems [CW, Oct. 29].

At the time the rule was amended to permit shared secure systems, Justice Department officials said they had "reevaluated" the dedicated requirement and found costs would be excessive.

Although two days were allocated for hearings here, so few testified that the hearings were wrapped up in one day. Additional testimony will be heard in Atlanta Nov. 21 and in San Francisco on Dec. 4.

The panel hearing testimony included LEAA administrator, Richard W. Velde; LEAA general counsel, Thomas Madden; and Dolan and Andrew Decker, hoth of the Federal Bureau of Investigation (FBI).

24-Hour-a-Day Job

"The law enforcement function demands a 24-hour-a-day, 7-day-a-week service for communications and information retrieval. These services are the 'lifeblood' of day-to-day law enforcement operations and responsibility for their cost-effectiveness must not be delegated in whole or in part," said Lieut. O.S. Neely.

Neely represented Search Group, Inc., a nonprofit corporation and successor organization to Project Search, established by LEAA in 1969 to study DP technology in criminal justice systems.

Neely emphasized that more rather than fewer rules are needed "in the absence of national" laws.

Further, rules are needed promptly to help states complete planning for implementation of a new section of the Safe Streets Act due March 16.

"Minimum standards for maintenance and use of intelligence files and sealing of the purging files also should he included in the regulation," he said.

In addition, provisions should he included that set limits on the use of arrest records without dis-

(Continued on Page 4)

Politics Blamed as N.H. DP Head Quits

By Ronald A. Frank
Of the CW Staff

CONCORD, N.H. – A behind-the-scenes political fight for control of the New Hampshire Department of Centralized Data Processing (CDP) has led to the resignation of its director, Arthur T. Hill.

Because of continued clashes between Hill and some memhers of the state CDP commission, including chairman Edward Berg, Hill resigned effective Jan. 1.

In his letter of resignation to the commission, Hill referred to a two-year "personal conflict" with Berg. This situation made it impossihle for him "to concentrate fully on the functions of my office" and, as a result, "the taxpayers of New Hampshire were being short changed," Hill wrote.

But Berg said "I am not political. I am trying to do the joh and see to it that CDP is giving the citizens of New Hampshire the maximum return on their investment.

"I think it was a great day for the citizens of New Hampshire when Hill resigned," he added.

The conflict in New Hampshire is the result of the creation of a central DP agency set up to service the computing needs of all state departments. Gov. Meldrim Thomson has increasingly attempted to get the CDP commission involved with the priority scheduling of programs and other internal matters, according to state sources, and this attempt at control has increased as more Thomson appointees have been named to the CDP commission.

The issue is one of accountahility of the CDP director. According to state law, the CDP commission is to have the "same powers of management, supervision and direction" over the CDP department "as the directors of a business corporation."

At the same time, the CDP director is to he appointed by the commission to "organize, establish and operate the department and employ necessary personnel."

After Hill resigned, Thomson issued a statement claiming the CDP operation has cost the taxpayers millions of dollars. "There has been a great reluctance on the part of CDP officials to cooperate with the heads of other agencies," Thomson said.

(Continued on Page 4)

Mini-Controlled Trains Idle at Giant Texas Airport

By Patrick Ward
Of the CW Staff

FORT WORTH, Texas – Automated trains no longer trundle around the giant Dallas/Fort Worth Airport here.

The computer-controlled "Airtrans" system [CW, July 3, 1974] has been idle since March, when its builder, LTV Aerospace Corp., stopped work in a contract squabble with the airport hoard and eight airlines.

The airport and airlines have sued LTV for $200 million in punitive damages. LTV in turn is countersuing them for $700 million in damages "due to loss of image and potential sales," according to an LTV spokesman.

"It's rather a tragic situation," the LTV spokesman remarked.

The airport and LTV signed a $34 million contract in 1971 for the Airtrans system, which carried passengers, luggage, mail and trash around the "World's Largest Airport."

Six minicomputers, rather than on-board trainmen, controlled the rubber-tired trains. The cars have hard-wired logic units which communicated through a

(Continued on Page 4)

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After Six Months in Court

Legal Maneuvering Marks IBM Trial

By Edith Holmes
Of the CW Staff

NEW YORK – It's been more than six months since U.S. vs. IBM opened here on May 19 – and two months since the Federal District Court reconvened following a two-month recess to permit further discovery and additional depositions in the government's antitrust action against the corporation.

When the trial resumed on Sept. 22, the parties had agreed to incorporate the bulk of the Telex record in the evidence of this case, the government had subpoenaed documents from Xerox Corp. to determine why that company had decided to leave the computer industry and observers had hopes the case would progress more quickly than it had during the spring and early summer.

But legal maneuvering – rather than the question of IBM's intent and ability to monopolize the systems business in the computer industry – continues to characterize this trial.

The Department of Justice is still in the market definition portion of the government's case and will be for some 10 more witnesses or so.

The government has made it through eight other witnesses, part of the testimony of a ninth and has added the deposition of Ray W. Macdonald of Burroughs Corp. to the several depositions read into the record last spring and summer. Thus, by the end of the 15th week of trial last week, Justice had presented and completed the testimony of 15 witnesses from its list naming over 100 people who will come before the court on behalf of the government in this case.

Certainly, the length of time witnesses have spent on the stand depends as much on cross-examination as it does on direct questioning. Cross-examination has always been at least as long as the government's direct and sometimes takes twice as much time.

Spending eight days on the stand, over half of them on cross-examination, Clarence W. Spangle of Honeywell provides perhaps the best example of this.

Some contend the defense is trying to prove its direct case on cross; others argue IBM is telling government witnesses that when they come to New York to testify. No matter how important or busy they are – they had better be prepared to stay awhile.

Spangle made numerous shuttle trips between his corporation's headquarters in Minneapolis and the trial in New York during the course of his testimony, and William C. Norris of Control Data Corp. sat patiently through the last two days of Spangle's testimony, waiting to take his turn on the stand.

Diversion From Charges

These kinds of tactics in the courtroom and actions relating to the procedures the judge hearing the case has employed in this trial have served to divert attention from the charges of monopoly against IBM.

The news fit to print concerning U.S. vs. IBM lately has centered around the decision by the Second Circuit Court of Appeals to grant IBM's petition for a writ of mandamus [CW, Nov. 12]. The issue of whether Judge David N. Edelstein, the sole arbiter in the case, had overstepped

Analysis

his procedural bounds lasted for some three weeks, from the time IBM first filed its petition asking that certain of Edelstein's orders be vacated until the appeals court rendered its decision. And during that time period, the mandamus action dominated all news accounts of the suit.

Very little has been said in open court regarding IBM's appeal to the Second Circuit, but there continues to be considerable speculation going on in the courtroom and among those concerned with the outcome of the case on how this public "dressing down" of Edelstein and the Department of Justice will affect the trial in the long run. In general, the belief is that the "long run" will be longer.

A second issue peripheral to the charges brought by the government against IBM and now at trial is IBM's request that the "gag rule" – Pretrial Order 4 – be removed. Both parties now declare the rule – an order IBM originally asked for and one to which the government has assented since it was adopted in this case in 1972 – unconstitutional.

The judge has yet to rule on this request by the parties. At this point, if the gag rule is lifted, IBM could launch a massive advertising campaign to influence public opinion.

The corporation's counsel has already argued it is only fitting for IBM to be able to publicly answer critical comments made against it in the press and particularly by the Computer Industry Association, allegedly on behalf of the government.

To a large extent, however, the fact the substantive issues of monopoly and intent to monopolize have not been more dominant in the tone of the trial or in its record of now nearly 8,000 pages is also a result of what is going on in the courtroom. The testimony of the witnesses that have taken the stand seems to have left much to be desired in the way of proving the government's points.

There is some speculation the government is saving its big guns – both in terms of witnesses and documents – until later; but others argue if the Department of Justice can't prove market definition aspects of its case, it won't be able to prove anything else it has charged.

The heart of the case has been exposed fleetingly in the course of the past two months of trial. In these instances, some of the problems the government may have unavoidably encountered in its efforts to prove its charges against IBM have been illustrated.

The first occasion occurred when Honeywell's Spangle was asked whether there are tactics IBM could use to force his company out of the computer business [CW, Oct. 8]. A second instance was when John J. Hangen refused to give some NCR Corp. documents to the defense counsel for fear IBM might gain a look at NCR plans for the next five years [CW, Nov. 19].

In proving intent to monopolize, the government needs to have its witnesses say they fear IBM actions in the marketplace. But – keeping their investors, stockholders and creditors in mind – few of these industry witnesses are likely to feel very comfortable saying "Yes, IBM could force us out of the market."

It is important to remember the government does not plan to try to prove IBM has done anything illegal, but that the corporation does monopolize and has taken actions showing its intent to monopolize the computer systems market. There are likely to be several more instances in which the Justice Department will have trouble proving intent.

Tension and Hostility

One last effect of the last two months of trial has been an increased tension and hostility between the parties in the case. Particularly during the events leading up to and surrounding the mandamus decision in the Second Circuit, relationships appeared strained.

At one point, IBM's lead attorney suggested the parties will never return to the appropriate level of amenities in this case – that what they must do now is concentrate on the substance of it.

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N.H. DP Head Quits Post; Politics Cited

(Continued from Page 1)

Countering the governor's claim of mismanagement, Hill cited figures showing CDP is now serving 16 state agencies and running 225 jobs on a regular basis that produce 525 scheduled printouts.

A total of 16,000 job/year are being processed by CDP, Hill said, and the books are being closed on time.

"The governor is either uninformed or ill-informed," Hill said, adding the state controller's office recently sent a letter to the governor taking credit for issuing that office's annual report early.

That happened because the entire document was printed out on the CDP Honeywell 6060 system, but no mention or credit was given to the CDP role in the project, Hill said.

Problem of Priorities

Typically state agency heads expect CDP to serve them without any problems, Hill said, but one problem which has developed is that a schedule of priorities has to be established to determine in what order agency jobs will be run.

The New Hampshire Legislature addressed the priority problem in June of this year and established a special committee to work with CDP on this function. But the committee has never met and its members have yet to be appointed by the governor, Hill said.

On hearing of Hill's resignation, George Roberts, speaker of the House, said "incompetent appointments by Thomson [to the CDP commission] are forcing responsible people" to leave state government.

Roberts, a former member of the commission who was not reappointed by Thomson, called for an investigation of the operations of Berg as CDP chairman.

No Rush to Judgment

CONCORD, N.H. – The New Hampshire Centralized Data Processing (CDP) commission has not met since September, despite the resignation of Arthur Hill, director of the state CDP department.

One commission member, John Chapman, attempted to call a meeting on Nov. 14 when Hill resigned, but the session was never held.

Gov. Meldrim Thomson said he could understand why Chapman was "miffed when I thwarted his attempts to call a rump meeting of the commission."

At least one other commissioner, Thomas Byrne, has called for a meeting to discuss the resignation and begin the search for Hill's successor. The commission chairman, Edward Berg, said he expects to set a meeting for the day before Thanksgiving if a quorum can be convened.

By law only the commission has the power to select and hire a new director of the CDP department.

Law Officials Cite Security as Sharing Concern

(Continued from Page 1)

positions. Federal rules also should contain provisions delineating what role the FBI or other federal agencies may play in the national computerized criminal history system, he said.

As for use of arrest records tor employment within the criminal justice community, Neely recommended that sealed as well as unsealed records be made available for this purpose.

Index of State Records

In the areas of the National Crime Information Center's computerized criminal history system, Neely recommended there be "no storage at the federal level of records related to state offenses unless the offender has a record of violations in two or more states."

Reiterating Search Group's original recommendation, he said the federal role should be limited to providing an index of records stored at the state level. Exceptions to this multistate single-state system could be permitted for "a reasonable" period pending completion of systems in states that otherwise would be unable to participate.

Howard M. Livingston, director of the North Carolina Police Information Network (PIN), stressed the need for criminal justice agencies to "set the priorities for use of the system's equipment and personnel" or there will be "no guarantee" that records in the system would be accurate and responsibility disseminated.

Anthony McCann, speaking for the National Association of Counties, supported the rule change saying dedication would not only have been expensive, but in reality did not address the basic danger to individual privacy.

"The greatest danger for abuse is not that files will be electronically linked to create a 'dossier' or that an unauthorized user will be able to activate a terminal to access data: The greatest danger for abuse is the unauthorized use of data by authorized users," he said.

"This must be dealt with by proper software control and rigorous enforcement procedures."

McCann added that the counties' only specific concern "with the new rules is the requirement that the administering agency be a 'criminal justice agency.'

"We believe that the chief elected state or local official under whose jurisdiction the information system operates should be charged with naming the responsible agency.

"The agency so identified must have policy and personnel control over the operation of the criminal justice information system and thereby clarify the issue," he said.

Ruffin Blaylock, director of the Alabama Criminal Justice Information Agency, also agreed with the change based on cost and the fact that "state-of-the-art technology . . . permits protection without dedication."

He also agreed with McCann's contention that privacy and security legislation should be directed toward people in the system rather than toward the tools they use.

He "respectfully" suggested that, when considering further regulations, LEAA and the Justice Department should "involve all members of the criminal justice community. We do not want another Oregon situation at the national level [CW, Oct. 1]," he said.

Survey Profiles Typical Net User

(Continued from Page 1)

Multiplexers are more popular (30 users) than concentrators (17 users) and most users have several of these units once they include them in their nets. Regional networks seem to be more numerous, numbering 64, than national nets at 40 and four users described their networks as international.

The use of dial-up and private lines is almost equally divided at 40 vs. 43 users, with several users having both types of lines.

The biggest problem area in a network is line quality, 29 respondents complained. Eight said telephone personnel cause problems; seven said multivendor disputes give them headaches.

Ten said they have hardware problems while five said their software is a problem area. Six said they are bothered by transmission errors and five said fault isolation needs improvement. Six users said they have no network problems.

CRTs appear to be the most popular type of terminal with 87 users while 59 said they have remote batch terminals. Close behind are interactive terminals with 55. Only 32 said they are operating intelligent terminals in their network.

Almost all users said they are planning some type of expansion or upgrade, but many said the changes are still in the planning stage. Many of these said they wanted to switch to faster hardware.

Almost all users said they run multiple applications on their networks, apparently to justify the cost of operating them. Inventory and accounting were two of the most mentioned applications and, in some cases, these run side-by-side with transaction-oriented uses like nursing station data and point-of-sale information.

Almost all nets are oriented to terminal-to-CPU traffic with only one user saying he plans to implement a CPU-to-CPU upgrade, the survey found.

Mini-Controlled Trains Idled

(Continued from Page 1)

signal rail with the human supervisors at the Airtrans central control console.

The minicomputer systems directed the vehicles and provided reports on the status of each train to the console operator.

'Nervous' Software

However, the train's safety software tended to be "nervous," in the words of an LTV spokesman, and sometimes brought trains to a stop in the middle of nowhere.

The software-controlled audio system that announced forthcoming stations didn't always perform reliably either, airport authorities said.

Modifications to correct these and other difficulties limited the number of Airtrans cars available for service, an airport spokesman said.

Both software bugs and loose wires could halt the trains, an LTV spokesman explained. Mechanical problems with the tape drives, not software bugs, caused the difficulties with recorded announcements, he added.

Overall, the computer control approach "worked out very well. We have been quite pleased with its performance and the way we designed it," the LTV spokesman said.

The airlines and the airport charged LTV wrongfully discontinued work on Airtrans after the airport refused acceptance on the system and proposed several changes.

LTV countered that the airport's refusal came after Airtrans had been in daily use for over a year. In that time, the system had transported over three million passengers and logged over 3.5 million miles, LTV said.

This operating experience "had fully demonstrated [both] the ability of Airtrans to meet the design requirements and the fitness of the system for every purpose intended by the contract," LTV said.

'Popular Power' Reigns

Portuguese Revolution Also Affects IBM's Workers

By Joseph Hanlon
Special to Computerworld

LISBON, Portugal – The "popular power" poster on the door shows IBM has not escaped Portugal's revolution.

This view is soon reinforced for the visitor by the list of salaries for all 500 IBM workers posted near the lobby.

Like other companies in Portugal, IBM has an elected workers committee. In negotiations with management, it has already won a cafeteria, official IBM employment with benefits and higher salaries for 30 low-paid subcontract employees and permanent employment for 25 students on short contracts.

Despite management opposition, the workers committee held an international IBM workers meeting in Lisbon in July in an effort to set up an international IBM workers organization.

Fifteen people from six other European countries attended, and the government considered the meeting important enough for the Labor Secretary, Dr. Carlos Carvalhos, to give the opening speech.

Earlier this year, the committee did a study of IBM's commercial activities and concluded that, because there was no competition, the company had substantially oversold its biggest customer, the Portuguese government.

Thus, many government computers were underused, the report concluded, and IBM should stop selling more computers and instead help users to make better use of the ones they have.

Other workers committee projects included placing pressure on IBM to post salaries (management refused, but this year a law was passed which requires it) and working with workers committees at IBM user companies to suggest people who might replace DP managers sacked because of links to the previous government.

Nevertheless, IBM has been much less affected by the April 25, 1974 coup than many other multinationals in Portugal. In particular, the old management remains in charge, and the workers committee does not have the direct power over the running of the firm that other workers committees have.

Furthermore, the IBM workers are less outspoken and more worried about offending management than in other firms. This may reflect the high wages paid by IBM – the lowest is $250 per month, double the legal minimum. But the median salary is $900 per month – seven times the statutory minimum. And most IBM workers earn more than the $420 per month over which level no salary increases are permitted.

Indeed, many IBM workers are not happy with what they view as a relatively conservative workers committee. Eighty staff members this summer joined the IBM Committee to Support the Revolution and signed a declaration which was posted in the main lobby.

This unofficial group has been participating in the neighborhood council in the Alvalade area where IBM has its offices. It also has a group studying the role of information science in a socialist society. Another project is support for freedom of the press – collecting money for the *Republica* newspaper and demonstrating against the military occupation of the radio stations.

Finally, a number of members of the group have spent weekends working on farms in Alentego, where they are both doing physical labor and helping to organize the accounting systems of the newly formed worker-controlled farm cooperatives.

The first ad-hoc IBM workers committee was set up within a few weeks after the April 25 coup. It was elected by a general assembly of all IBM workers.

In July 1974, a formal workers committee was elected, with one representative from each of the 17 sectors in the company – office products, data processing, etc.

The next election took place this July for a revised workers committee. Instead of following the IBM divisional arrangement, the 17 people were elected to represent each professional group (secretaries, salespeople, systems analysts, etc.).

'Bad' Checks Undergo Recycling Into Dough

SAN JOSE, Calif. – At least two negotiable but improperly computer-coded Santa Clara County checks scheduled for destruction at a recycling plant were illegally recycled into money here recently.

Two county checks totaling $600 were cashed by unidentified persons; six checks have "turned up" altogether, according to William Meyer, head of Santa Clara's Office of Public Administrator and Public Guardian.

There also is a possibility that 660 or more checks may have passed into the wrong hands, Meyer indicated.

A total of 10,000 county checks intended for Meyer's department were incorrectly printed by a private firm.

The checks arrived at the Office of Public Administrator in "15 or so" sealed packets. When one of the packages was opened, employees discovered the checks were incorrectly numbered, rendering them useless, Meyer recalled.

"We had them under lock and key, waiting until we received a directive from the Finance Department, which eventually ordered the checks be destroyed by a private firm which handles the destruction of sensitive paper materials," he explained.

Complying with the directive, Meyer's assistants brought the checks to the firm, laid the packages on a conveyor belt and waited until most of the checks had dropped off the conveyor belt and into an acid solution.

Somebody at the recycling plant "must have grabbed a handful of checks" from the unsealed package before it dropped into the solution, he theorized.

The Sheriff's Department is conducting an investigation, but no suspects have been apprehended, he said.



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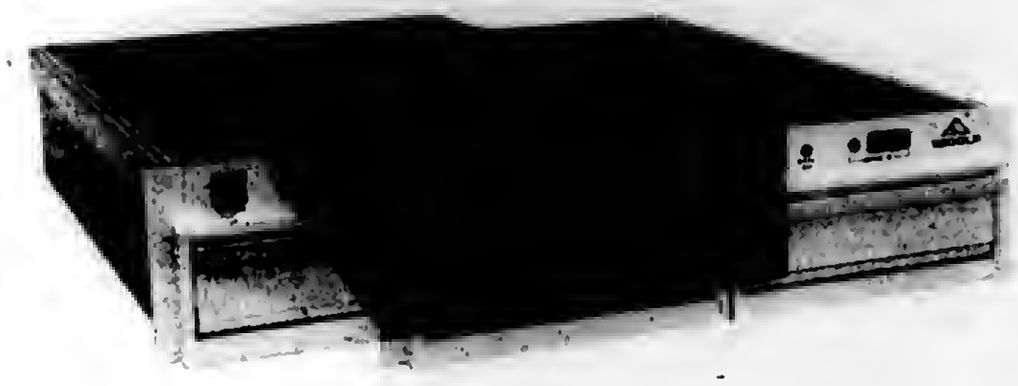


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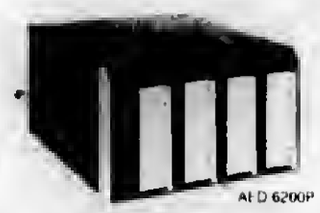
The new system comes with an AED interface for PDP-11 or NOVA Eclipse plus a floppy disk with Diagnostics and an Initialize Routine. Other AED interfaces will become available in the near future, and for those desiring an AED 6200 drive unit without interface, this is also available at a reduced price.

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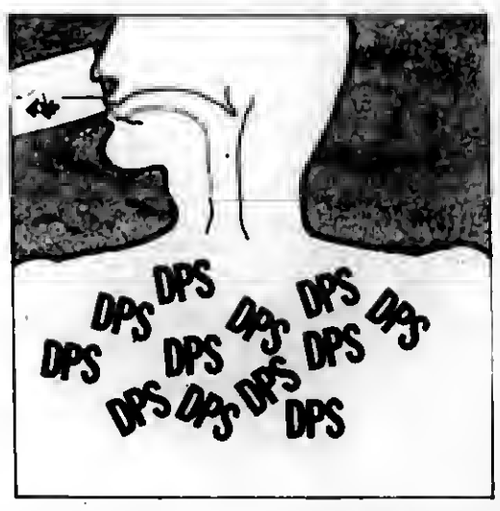


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This Year Alone

DP Crime to Cost Users Millions

By Toni Wiseman
Of the CW Staff

TORONTO – Espionage and theft involving computers will cost users of DP equipment millions of dollars this year alone, attendees at a recent conference here were told.

"Today's systems of both distributed and centralized data bases, multiprogramming, virtual machines and complex operating systems running in complicated data communications networks are wide open to the would-be spy," according to James F. Finch, president of DCF Systems of Canada.

"It would appear the majority of discovered cases are not publicized because they would tend to put the victimized company in a bad light," he said.

"It is estimated only 15% of all computer-related crime is ever reported. If this estimate is correct, then more than 500 acts will be committed in 1975, totaling many millions of dollars," Finch added.

Finch introduced his audience to what he termed "espionage and theft using computers" with some of the more famous cases, ranging from Equity Funding to the Cal Tech-McDonald's episode [CW, June 4].

He defined computer systems penetration as the act of unauthorized access to or control of data procedure and machine resources. This penetration, he said, could lead to observation, extraction, alteration, addition or utilization activities.

"The extent of system compromise may vary with type of penetration from accidental display of the contents of a file to complete loss of control by the operating system," he noted.

Sharing Abuses

The concept of ownership of data or programs in computers is often misunderstood, Finch said, noting that while data is owned by a user who only utilizes the system to store and process it, this data is often shared among users.

"It is misuse of the sharing privileges that causes difficulties and, combined with design flaws, permits penetration," Finch stated.

"Because terminals, communications lines and concentrators transmitting data are vulnerable to penetration, penetration becomes a greater threat as greater use is made of remote terminals and terminal networks," he said.

Finch outlined six major categories of penetration techniques:

- Browsing – of which searching a trash basket for log-on passwords or user identifications is the most basic form – often provides enough information to impersonate a legitimate user.
- A foible, or an accidental or unintentional opening that permits unauthorized access to information, can occur in either hardware or software, often because a programmer has inadvertently allowed an obscure condition to occur for which no check is made.
- An artifice is the intentional introduction of clandestine code into a system to be used later for subversion from within. It can be implanted at the time the system is implemented or during subsequent modification.
- An impersonation, or unauthorized activity carried out by masquerading as a legitimate user or device, is often used to subvert a computer system together with other penetration methods.
- Tapping is the gaining of access to a system via direct connection to a communications link or a part of the central system. Switching networks are particularly prone to this type of penetration, Finch said.
- Radiation, or passive eavesdropping without direct connection, siphons data from a system by detecting acoustic or electromagnetic signals emanating from a system or component, in particular communication lines and CRTs.

Finch suggested data encryption techniques as a possible method of thwarting would-be criminals. In particular, techniques should be used that require a thief to spend more money to break the system than he would spend to develop the information himself.

"As system protection mechanisms and procedures are improved, the penetration work factor necessary to gain access by technical methods could become so great that other methods, such as buying off an employee with access to the information, would be less expensive," Finch said.

The next best thing to penetration prevention is penetration detection, he stated. By using hardware and software monitors to track file and data base access by user and time, utilization profiles can be developed. Thus, if the monitor detects a deviation from profile, a security alert could be sounded, he said.

"An additional safeguard might be a security console displaying security messages. A systems security officer with the proper authority could, via the security console, monitor and if necessary limit file access or remote log-on," Finch said.

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Free Federal Matching Program Helps Commuters to 'Pool It'

Motorists in several cities and states are "pooling it" with a computer car-pool matching program available free of charge from the Federal Highway Administration (FHWA).

The advantages of car pooling are self-evident, according to Edward Fleischman of the FHWA. Presently, the average auto occupancy in the U.S. is 1.4 persons per car, he noted.

The cost of operating a car with only one occupant is $2.64, the highest cost per passenger of any mode of travel. However, a car with four occupants costs only 66 cents per passenger, he said.

Companies, too, can save with car pooling because it cuts their parking costs, Fleischman said. A multitiered inner-city parking facility can cost a company up to $909 per parking space, with suburban lots running up to $500 per parking space.

Commuter Computer

In Los Angeles, an independent nonprofit corporation has been set up to administer a modified version of the FHWA program.

Commuter Computer presently involves about 1,000 companies and has a data base of 47,000 to 48,000 names.

But only about 10% of the people in the data base probably are participating in a car pool, a spokesman estimated.

The service is available in five counties surrounding Los Angeles, and the programming is done by the city's DP center.

The matching process is based on a grid system overlaid on an urban area map to which home and work locations are manually coded. A file of participants in the program is constructed, and participants are matched if they live and work in the same areas and arrive and depart within a specific range of time.

The State of Tennessee Department of Highways, the first user of the FHWA program, currently has a data base of 5,000 people. The service is available to the 15,000 employees of the state government in Nashville.

The Nashville program received a great deal of publicity at the outset, including a news feature on CBS-TV, which spurred a lot of initial interest, according to James Stewart, director of management systems for the department.

There is no ongoing campaign to recruit additional members because all the reserved parking available to program users is currently in use.

The program is run on the department's IBM 370/155, and "it is very easy to use," Stewart said.

The cost of setting up the system was 15 cents to 20 cents per person, he said.

The City of Dallas Department of Traffic Control started using the car-pooling program in January 1974, Sue Haynes of that agency said.

It is available to anyone who works in the Dallas area and presently has 48,000 names in its data base.

When the program was started, information booths were established in major office buildings to provide application forms, and the department has since hired an advertising agency to design a continuing promotional campaign.

If the goal of the program – to reduce the rate of passengers per car from the present five people in every four cars to six passengers in every four cars – is accomplished, 20,000 pounds less of pollution per day would be emitted and 40,000 gallons of gasoline would not be consumed, Haynes said.

The Connecticut Department of Motor Vehicles is taking another approach to soliciting car-pool participants. In October, it began sending car-pooling application forms to all motorists when they renewed their registrations.

As the program progresses, motorists wishing to participate will be sent printout lists of other participants in their area. New applicants will be added and persons who have formed car pools will be deleted from updated lists.

After six months of operation, Denver officials estimated some 80% of those who have inquired about a smaller scale program there have actually begun car pooling.

The Colorado Air Pollution Control Commission requires all employers of 50 or more people to offer a carpool locater service to employees, according to David Pampu, assistant director of the Denver Regional Council of Governments. Participation is strictly voluntary, he noted.

More than 15,000 Denver residents used the service in the first six months of operation.

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Editorial

One Step Forward

U.S. Attorney General Edward H. Levi should be congratulated for shelving the Federal Bureau of Investigation's (FBI) plan for a computerized message-switching system for criminal history information [CW, Nov. 19].

Clearly, his action must have come up against a great deal of internal pressure from the bureau to establish such a system, since the FBI is not known to be shy about pushing requests that would expand its bailiwick in the criminal justice field.

However, the move does not go far enough.

Criminal history information is still the responsibility of the FBI, even though it will not be allowed to set up a special network for the interchange of such information.

This should not be so.

Criminal history information is extremely sensitive, since it includes information on all arrests, even if they did not result in convictions or even trials. The FBI's internal procedures are not strong enough to ensure that the records are updated to include information on the disposition of the case.

Centralizing this information, which may be inaccurate or misleading, is not necessary for any law enforcement purpose, since many people whose names would be in the file never have been found guilty of anything.

Clearly, this information differs drastically from the other types of information found in the bureau's National Crime Information Center (NCIC).

Most of that information concerns wanted persons, stolen cars, guns or securities. It is information that is needed immediately by policemen in the field and is about people or things sought by police agencies.

The criminal history information stands out like a sore thumb among these other files.

It is not about people who are currently sought in connection with a crime, but rather about people who have been arrested — whether rightly or wrongly — sometime in the past. People, often who were just in the wrong place at the wrong time.

Under our system, a person is innocent until proven guilty in a court of law. By maintaining criminal records on anyone ever arrested — whether found guilty or not — this concept is in danger. A person is branded by an arrest record, whether or not he is guilty.

So Levi should take the next step and ban the collection and centralization of this type of information at all levels.

Records on persons arrested, but either found innocent or released without a trial, should be destroyed. They serve no legitimate purpose and undermine our concept of guilt and innocence.

If Levi is not willing to go this far, as he should, then he should remove the responsibility for keeping the records from police agencies such as the FBI and place that responsibility with a more neutral agency such as the court system or a body especially created for the purpose.

The responsibility for these records should be removed immediately from the FBI, pending a final resolution of the issues they raise.



Letters to the Editor

Other Possibilities Exist For Monitoring Government

I was fascinated by the article on congressional use of data processing in the Nov. 12 issue, especially where *Computerworld* told of plans to tie into the Executive Branch checkwriting computer so Congress would always know where the taxpayers' money was going.

I am surprised no one mentioned an even more desirable computer possibility. If Congress were to tie in the vote-tallying computer with the budget computer, it could program it so that, whenever a vote was cast for an expenditure of funds without an accompanying revenue bill, the voter would get a NO-OP.

Walter E. Wallis

Menlo Park, Calif.

Non-Bell DAAs Won't Be Free

In a Nov. 5 editorial, *Computerworld* stated that the California Public Utilities Commission is allowing non-Bell modem manufacturers to build Data Access Arrangements (DAA) into their systems and sell the complete package to the user.

The upshot of this feature is that the user will no longer incur the additional expense of the DAA.

However, will this in fact be true? The utilities company argument against this action is that the equipment will have to be certified by some independent group, and this certification will not come free.

The cost of the certification will in turn be passed on to the customer and, as a result, will eliminate the advantage of doing away with the Bell DAA, according to the utilities company spokesman.

I think readers would be interested in California's experience in this respect.

B.L. Pittman

Denton, Texas

DP Could Help Sort Mail

Regarding the article on the post office [CW, Nov. 5], it is extremely curious that the U.S. Postal Service, which has been described as the largest DP organization in the world, appears to preoccupy itself with "blue-sky" computer projects.

The so-called Kokomo plan for automated carrier route assignment appears to be a prime example of this.

The obvious area where the post office could reap the greatest benefits in computer technology is in the actual sorting of the mail. This occupies 20% to 25% of the average mail carrier's time and is obviously a much larger percent of the average mail clerk's time.

Yet, even in this area, the "blue-sky" approach of print-font reading of Zip Codes has been taken. I understand from what I've read that only modest success has evolved from this several-year project.

As a person who has been involved in the dull, tedious activity of sorting mail by hand both as a U.S. postal clerk and carrier and as a person who now enjoys the satisfying work of computer programming and systems analysis, I continue to be disturbed.

If a stamp or envelop were designed to accept mark sensing, letters could be sorted by relatively simple machines utilizing mark-sense technology (a technology that has been around for decades).

An expansion of the Zip Code to nine or 10 digits could allow for the automatic sorting of mail to the individual.

Howard Glastetter

Olympia, Wash.

Industry Has Responsibility

Laurance F. Wygant's response [CW, Nov. 5] to my letter [CW, Oct. 8] indicated a need for clarification of some issues.

Originally, I questioned the humaneness of a *Computerworld* article that expressed a sense of meritorious achievement because computer-generated statistics were useful in the support of pro-abortion legislation at Barbados.

Such statistics represented probable trends, not certainties. Was the data provided to prompt hope or despair? What kind of hope is it that is aroused which results in legislation that supports human death of the most defenseless of humanity, the unborn infant?

Does not the computer industry have a burden of responsibility regarding the use of its productivity?

David A. Fuller

Renton, Wash.

Seminar Response Overwhelming

I would like to express my thanks to *Computerworld* for publishing my article "Seminar Can End Structured Programming Confusion" [CW, May 28].

Reader response has been overwhelming and came as a pleasant surprise.

To date, there have been over 800 requests from U.S. companies, over 60 from Canada and an equal number from overseas. I would like to thank all those who responded to the article.

Gopal K. Kapur

Danville, Calif.

(Other letters on Page 10)

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

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Documentation Must Reflect Viewpoints of All Users

By Joseph T. Rigo
Special to Computerworld

It has become fashionable to talk about looking at a computer system from the users' point of view.

The catch, for members of a developlent project team, is that there is no single user viewpolnt. The data-entry staff has one set of needs. People who use the output reports have another. And the West Coast salesman has a third.

Their different requirements must be reflected in the project's documentation. Three points in the development life cycle are particularly critical.

First is during the system study when analysts and users are investigating the current system, if there is one.

Second is in the preparation of requirements and functional specifications for the new system.

Third is in designing user manuals and other reference materlals for the operational system.

It is not enough to cover all topics somewhere in the mass of paper. The material must be presented in ways that are meaningful to those who review and approve drafts.

This is not accomplished by dropping a massive report on a manager's desk and asking for sign-off in 10 days.

Poor user documentation has identifiable symptoms, just like bad programming. Often, however, project teams are not alert to these symptoms. They blame their troubles on public relations or personality differences.

Calmness a Bad Sign

One odd but real symptom of bad documentation is that user supervisors remain

Reader Commentary

calm during the system study. This means the project team is simply collecting data for programming specs.

Analysts are not digging into the user's work flow and reporting information to give supervisors a fresh outside view of their daily operations.

When the study team is dðing a thorough job, supervisors are horrified to find out what has been going on. The problems may not be enormous, but the supervisors make immediate changes to correct them. While they are at lt, the supervisors throw in some other ideas they have been meaning to implement for years.

These actions help the users smooth out current operational bumps while the new system is in development.

There are other, more conventional symptoms of bad documentation:

- Objectives change daily. Users' true requirements get twisted to fit the capabilities of a favored software package.
- Users do not participate actively, and they stall on key decisions. Yet they sign every approval form put in front of them.
- Despite frequent meetings, it is not until system test that key user staff members raise objectives to the system design that cannot be overlooked.
- Parallel test lasts forever.

There is a different set of symptoms after the end of the project. Most commonly, the users simply ignore whatever documentation was provided.

There are other indlcations of poor work.

- The users "lose" parts of their system. They keep asking for modifications to implement features they already have.
- Clerks cross out totals in their computer-generated reports. They consult notes scrawled on the baeks of envelopes and write in new totals. They know there are errors in the master file. The system includes a program to adjust errors, hut the users are afraid to run it.
- If you are a software vendor, you modified your user manual to give your customers exactly what they asked for. They still don't like it.

The fastest and easiest way to make some improvement is to organlze reports, specifications and manuals accordlng to users' staff jobs. For example, eonsider an applIcation involving the following aetivities:

- A customer inquires by mail about a product.
- The inquiry is referred to the salesman who is responsible for the customer's region or industry.
- The salesman contacts the eustomer and reports the results back to the home office.
- The sales manager periodically reviews a record of recent inquiries and the results of sales calls.

The company develops a computer system that is involved In each of these steps. The project team supplies a user manual.

Chapter 1 contains layout forms for all files, records and input cards.

Chapter 2 contains a printer spacing chart and a sample copy for every report, form or letter produced by the system.

Other chapters list error messages and contain instructions for filling out the form to get on-request johs run. Inevitably, there is a system flowchart somewhere in the manual. It is beautifully drawn and professionally accurate, but it doesn't mean much to the West Coast salesman.

(Continued on Page 10)

RPG Forges Ahead of Cobol With Five-Part System

The latest development on the commercial computer front came from Data General Corp., where Boh Nichols and Steve Schliemer have replaced the standard single-program language compiler concept with a five-program "package," including a compiler, two source-language and two object-time quality controllers, all bound up into a language system.

The Taylor Report
By
Alan Taylor, CDP



In doing this, they have left the other major commercial language, Cobol, far behind.

The new system, called the Eclipse RPG-II language system, is already operational in the field. It provides a user with standardized aids to accuracy and productivity during program running and during all the development and modification phases that precede actual operations.

This can prevent users from having to use potentially important and sensitive running in order to test an application or a change – a practice which has little to recommend it, but is used far too often by our profession.

Instead, simulated running and inspected object-program analyses can precede any use of the program and permit a greatly improved acceptance-test facility to be insisted upon by users.

Naturally, such developments do mean professional programmers have to take on the responsibility of being able to use the tools provided and so upgrades their profession.

Hopefully, most programmers will welcome such upgrading of the service they can give to their employers and clients, and we won't be plagued with more of the "assembly-superiority" arguments that held back Cobol for so long.

Programmer Productivity

The precompiler or editor's major function is to increase the RPG programmers' productivity. It approaches the task in the standard way of providing syntactic line-by-line analysis of the source code in a multiterminal interactive manner, thus keeping the machine cost down. New specifications can be added, old ones changed, numbering can be recalculated, etc. – all of which helps both early programmer productivity and program modifications. And, of course, its use cuts down on the number of compilations needed before a clean object program is created.

The post-compiler, or program analyzer, is the most ambitious part of the language system. This produces an as-easily readable program as any Cobol system. For instance, file handling is described file by file, interpreting the meaning of the various specification entries so that one doesn't have to be an expert RPG programmer to notice errors in handling the files or the computations.

Beyond the interpretation of the coded RPG input, the analyzer documents the results of having various indicators on in separate paragraph-like hlocks. Each block gives details of where the indicators are turned on and all the various results that ensue.

This prevents modification of one part of a program from introducing errors into another part of a program.

The final part of the postcompiler is the production of printer-type output showing the format, the picture and name of the various fields and the relationships between alternative or superimposed formats. The user, then, can expect the correction at the postcompiler stage of many program errors which otherwise would not he found until testing or production had started.

Once the object program has been tested for errors that are simply program errors, the problem of testing the program arises. Too often this is left out of the process, and the user is left doing the tests with live data. The Data General-run simulator (called RPG debugger), provides a test-bed for the program testing which allows the introduction of specific data, setting of breakpoints, modification of indicators, etc. under programmer control from an interactive terminal. It provides, as well, an entry into the dumping procedures which the run simulator shares with the actual production-run facilities under this system.

System Part	Programmer Use	System Action	User Results
Precompiler	Writes raw source code or uses earlier code from library.	Checks raw source for errors end gives eid in modifications.	Increases progremmer productivity. Reduces wasted compiletions.
Postcompiler	Checks output interpretations of logic, formats of reports, etc.	Interprets and documents the object progrem in source-code terms and outputs.	Provides documentation without programmer effort. Provides easy-to-understand highlighting of programming errors before any testing needed.
Run Simulator	Originates testing plan for aither general or special cases and carries it out.	Operetes with reel or forced date, with snapshots, etc. in source lenguage.	Permits (but does not requirel testing to be handled and documented before a program is accepted for live-data testing. Provides an immediete end standerd wey of treating a production program problem erea with little delay.
Run Controller	Sets eutomatic ebort procedures or provides for operator actions in operating instructions.	Activates cross-referencing between source-language program and machine code end provides understandable output to RPG progremmer.	Provides standerd documentetion of abort-ceusing processing with chance of increased quicker error discovery and run-correction.

The four parts of the new Data General RPG language system which complement the compiler itself are described above in capsule form, together with the advantages a user can expect from the use of such language systems, as opposed to simple compilers. It should be noted that the run simulator can be used after as well as before the run controller.

Production-Running Check Points

The final stage of program use is, naturally, the production run. Even here, however, there is always the chance of something going wrong, either in a totally unexpected way or else in some way in which the programmer would want to halt further processing until some action outside the program running could take place.

Data General provides for these program needs with a run controller. This allows manual or preprogrammed calling in of a formatted dump which includes details from the source program (table names, etc.) to assist in understanding what was going on when the mishap occurred.

Internal variables, such as the last table entry that was looked up for all the tables, and details of actual formats used, such as packed decimal, etc. are included.

In addition, the manual provides cookhook-type instructions for the use of a formatted dump.

So, there it is. The language system consists of a compiler, a precompiler to look after source-code problems and a postcompiler to document in an understandable fashion the object code produced. A run simulator for whatever test procedures the ingenuity of the programmer or the demands of his user require and finally a run controller to force necessary aborts to bring with them already-translated and processed information in terms of the source program, not just in terms of what is contained in various forms of memory.

It's a real advance toward the day when high-quality programming is expected to provide freedom from surprises and user controls over his active programs as well as over his programs in development.

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Letters to the Editor

CW Coverage Spotty On 'Number Crunchers'

I look to *Computerworld* for a nontechnical overview of the entire field of computing.

What areas CW does cover, it covers well.

However, the coverage is often very spotty, and I object to this. I know there is only so much that can be covered each issue, but there are those of us who are interested in areas of computing including, but extending beyond IBM computers, IBM software, business data processing and related material.

CW does tend to forget there are people out there who use Control Data Corp. "number crunchers" and use them for other than business DP applications.

The reporting on the Amdahl extension of IBM-type equipment and the desire to hear of the CDC-type extensions Seymore Cray and Cray Research, Inc. have produced in the Cray-1 Computer served as the catalyst for this letter.

Rayner K. Rosich
Arvada, Colo.

Free Spirit Speaks

Even though Jerrold Asher's visions of the "professional image" [CW, Nov. 12] will likely become reality some day, not everyone shares his particular dreams for the future.

Asher claimed "programmers seek respect on the one hand while condoning freedom of spirit on the other. The two don't mix." This depends on the type of respect sought.

If one wants the "respect" of people whose already confused thoughts can be completely snowed by a clever program of public relations, then Asher is right.

Programmers can emulate doctors and lawyers, whose professionalism is the apparent target, by wearing lab coats or similar vestments (perhaps with a red stenciled "P" on the front?) and burying "every major or minor proceeding in pounds of documentation . . . written in obscure terms only they can interpret."

What value respect has under such circumstances is not made clear.

However, if one would rather have the respect of people who understand and rationally appreciate one's abilities and performance and be judged solely on the basis of one's work, then freedom of spirit and professionalism are not incompatible, but are absolutely necessary for each other.

The economic issues brought up in the article were also disastrous. Asher drooled over the guild structure of the legal and medical businesses as a model for DP.

But holding the public hostage by a scheme of price-fixing, eventually to be supported by coercive governmental measures, as it has been in those other industries, does not seem to be a wise way to get public respect.

Perhaps some people yearn to be overpriced maharajas of data processing. I do not.

It is sad that computer programming cannot be spared the trappings of the professional mystique. Before freedom is sold out to such dubious "professionalism," however, it should be known that, among us unprofessional programmers, the "mysterious alchemy" which awed Asher so much is known in our free-spirited language as "bullshit." Anyone who desires to build professional respect on such a shifting foundation deserves whatever he gets.

Glenn E. Sieferman
Chicago, Ill.

Check Digits Unneeded

My only possible reaction to Alan Taylor's rather heated discussions recently over check digits is "yawn." My firm unfortunately is too small to need a sophisticated predata entry technique like check digits.

We are not fortunate enough to have all of the preprocessing requirements of key punching, edit runs, batch updates and all of the things that keep big busy companies running their computers 24 hours a day.

Our Singer System Ten (which ranks somewhere about 3 inches off the ground on the totem pole of system hardware/software sophistication) somehow manages to do direct access into master files by use of a CRT display terminal – the CRT readout tells us whether the account that was entered is valid or erroneous, and we somehow manage to keep seven application systems on-line at all times.

It also does direct file updates (with numerous controls built in) and we have never done an edit run. We don't have a computer card or a tape diskette on our premises.

Ah, if we could only have a larger machine for more sophistication.

Perhaps Taylor will someday realize things like check digits belong in the history books of data entry techniques.

Maybe one day large-scale computer data entry systems will progress to the point where thousands of on-line minis are today.

Edwin Levy
Philadelphia, Pa.

Out in Left Field

Kenneth L. Morris [CW, Oct. 15], Roger Poole [Nov. 12] and all other Cobol programmers who must debug Abend dumps at the core level will be pleased to know that a book which directly addresses this topic will be available shortly.

This coming April, John Wiley & Sons will publish my book, entitled *Abend Debugging for Cobol Programmers*.

The book provides integrated methodologies which assist the OS/Cobol user who must debug dumps at the machine level.

B.H. Boar
New York, N.Y.

Help on the Way

The recent Taylor Reports on check digits were way out in left field.

Check digits are appropriate for numeric identification codes, but the vast amount of computer input isn't or can't even be batch-totaled for validation.

And surely common batch-total techniques can't compare with the error-catching ability of clever check-digit schemes.

I wish Alan Taylor and *Computerworld* readers would think more about the broad category of data validation than just check-digits.

Peter Rennick
New York, N.Y.

Documentation Must Consider Users

(Continued from Page 9)

The simplest improvement is to take the same material and sort it on a different column. For example, create a separate chapter (or document) for the person who will record the initial customer inquiry.

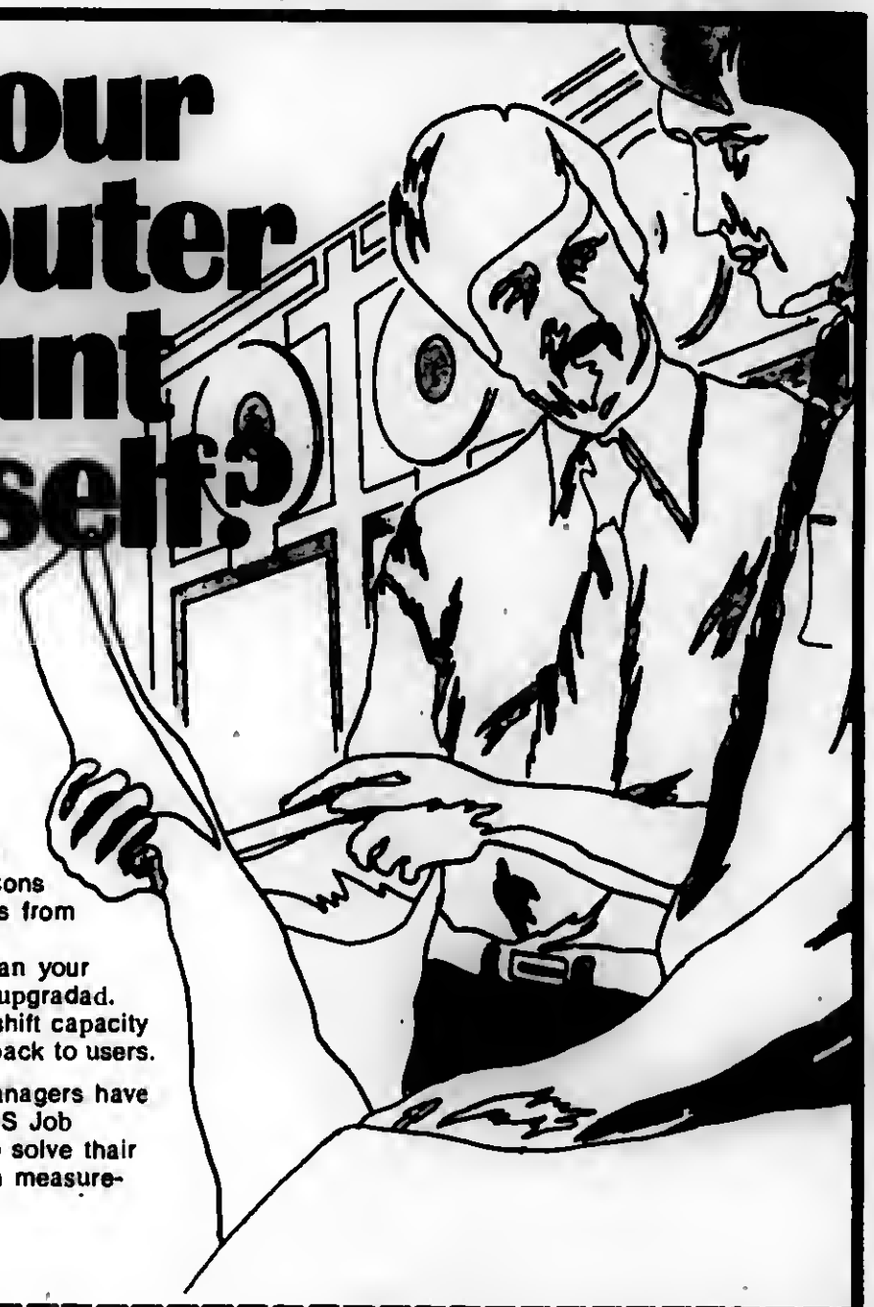
This chapter contains the card format for making the entry, information about how to get the customer inquiry program run and a sample copy of the report that the clerk will get in response. The chapter includes an additional page or two about what to do with copies of the report and who to call in case of trouble.

Similarly, subsequent chapters contain the material that is relevant to each of the other three activities. The flow chart gets sent to the systems maintenance staff where it can best be appreciated.

This approach to organizing and presenting information should be followed from the very start of the project. Each user finds it easier to review drafts and suggest changes if he is not swamped with data about someone else's job.

Rigo is a documentation consultant based in New York City.

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Mark IV Speeds New Systems

Gentle Approach Lets Users Keep Old Input, Output

By Don Leavitt
Of the CW Staff

ST. PAUL, Minn. – The end user of a company's DP capabilities – the supposed beneficiary of the systems – often becomes utterly frustrated with the demands and time delays that seem to be inherent in a Cobol-based development operation.

The situation gets so bad "in many cases [the user] doesn't even articulate his full needs anymore" because of the frustrations he experienced in the past, according to Douglas Smith, director of materials, management systems and planning at Buckbee-Mears Co.

Smith said his company overcame many of the users' frustrations by acquiring a package which provided an orderly structure for the development process. "About two years ago we purchased Mark IV [from Informatics] as a procedural language, a file management system and a report generator," the manager explained.

The conglomerate took a gutsy approach. The software "was not purchased as a secondary language, but as a total replacement for Cobol. Since that time, all new systems and virtually all reports have been coded in Mark IV," Smith added.

New Development Approach

Along with its new support package, Buckbee-Mears put together a new approach to developing systems. In outline form, it calls for the DP staff to:

- Review the current (or proposed) system and identify the types of reports and inputs desired by users..
- Define the data fields and file structures needed to support the users' desires.
- Implement new file structures with current input and output reports.
- Develop and implement new reports and system extensions incrementally.

The initial review "differs . . . in depth and in detail" from what Smith did in the past. "We do not detail report formats, input documents or program decisions," he said. "We develop a broad concept of the types of reports and capabilities the user expects of the system."

Next Buckbee-Mears "defines the data fields that will be necessary to provide the types of reports desired.

"It has been our experience that these can be defined without having to specify report formats. In fact, we find it easier to develop information requirements with a user," Smith noted, "if he does not have to identify a specific report where [the information] will appear."

File structures are then designed to provide maximum flexibility for updating and outputting the data. The DP staff attempts to arrange the fields in the logical way without regard to complexity of hierarchical structure or record size and to minimize the number of files, Smith explained.

Concern for Users

Concern for the user shows up clearly in the next step. The DP staff writes programs to update the newly defined file structures from current inputs. Output reports are written from the new file structures with minimal changes.

"This approach allows us to check out the system," Smith said, "without introducing the confusion which accompanies most large conversions when users are given new inputs and outputs."

Once the base system is judged to be fully operational by both the DP staff and the users, extensions are considered. In any project, he noted, there are a number of report requests or other changes built up during the implementation phase.

In conventional Cobol-based operations, such enhancements may have programming time and cost considerations equal to those of the base project itself, but they "can be quickly coded in Mark IV with the new file structures," Smith asserted.

Coding ease has been matched by other efficiencies, according to Smith's estimates. The pilot system was a materials inventory operation servicing purchasing, material stores, accounting and production functions. Though complex, it required only eight man-months to develop and execution time was reduced 50% compared with the earlier Cobol implementation.

The job order system – "very complex" – provides 22 reports to three divisions on job status and job costs and edits and balances attendance and job hours. Execution time is the same as the old system, Smith admitted, but disk space has been reduced 90% and the information is "immeasurably better due to more comprehensive and selective reports."

Training takes up "probably a quarter of the time" needed for training in Cobol. There is less risk involved in assigning trainees to major systems in Mark IV since there are fewer options available to them and it is much easier to clean up poor program design, Smith concluded.

Univac 9000, Series 70 Sites Promised Help Moving to VS/9

BLUE BELL, Pa. – Users of Univac 9000 series, Series 70 and Series 90 CPUs have been promised a set of routines to ease conversion to machines running under Virtual Memory Operating System (VS/9). The support will be ready the third quarter of next year, Univac said.

The routines include source language translators for Cobol and Assembler, an RPG-II compiler for the VS/9 environment and features added to the operating system itself "to make it more compatible with OS/4."

Announced in January coincidental with the "death" of OS/7 [CW, Jan. 29], VS/9 is the control software provided by Univac for models 60 and 70 of the Series 90 equipped with a dynamic address translation (DAT) box. The operating system and the DAT box were first delivered about a month later.

OS/4 is the operating system originally offered with the earlier nonvirtual models of the Series 90 line and with newer models of the 9000 series. Originally developed by RCA, TDOS and DOS have been regularly enhanced by Univac since it took over the RCA user base as its Series 70.

The source language translators accept Cobol and Assembler programs, including user-written macros, developed under OS/4, TDOS or DOS. From these, they generate equivalent program acceptable to the VS/9 language processors, Univac explained.

Transcriber Routines

Library transcriber routines transfer source, macro and Cobol Copy libraries to VS/9 files, and other routines allow disk files now under the older operating systems to be dumped and reloaded in formats acceptable to VS/9 operations.

The VS/9 RPG-II compiler is described as "highly compatible" with the OS/4 compiler. Among the special features added to VS/9 itself to aid conversions is a procedure capability for the VS/9 assembler, Univac said.

Existing facilities in VS/9 also support moves to the system, a spokesman noted, pointing to a virtual memory editor for applying source changes to programs and an interactive debugging aid.

All of the newly announced conversion aids will be distributed free.

Hierarchy Diagrams, Lists Called Control Keys

By George Waybright
Special to Computerworld

In developing systems, much more importance should be attached to the active use of the program hierarchy. Although the concept of the hierarchy appears in most discussions of structured programming, references are usually no more than mentions of its existence.

Concepts and Techniques

In fact, the hierarchy should serve as the central theme throughout program design, implementation and maintenance, providing the basis for continuity throughout the system's life cycle. It exists in any program where the three structure rules (Sequence; IF . . . THEN . . . ELSE; and DO . . . WHILE) are strictly employed and is actually forced into the program as a result of using those rules.

Herein lies one of the problems of current thinking. Usually the programmer is given the rules and told to develop his program with them. When the emphasis is shifted to the hierarchy, the program is designed as a result of functional analysis and then implemented using structured rules!

But this requires techniques to aid the programming team in focusing on the hierarchy from early design through implementation and maintenancc.

Documentation Tools

For our own work, we developed two tools which document the hierarchy and make it more visible to the programming team: a functional diagram and a paragraph structure report.

The first is a simple design document, prepared manually by the programmer, as shown in Figure 1. If the programming team has done a detailed functional analysis of the information system to be replaced, this becomes an extension of that analysis. The design is a restructuring of existing and new functions to be implemented as a programmed system.

We follow several rules to ensure continuity and completeness in preparing the functional diagram. A naming guideline states each function name in the diagram is to be shown exactly as it is to appear in the program.

In using thc Hierarchical Input Process Output (Hipo) method of documentation

(Continued on Page 13)

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Regional CMGs Set Meetings

Regional user groups affiliated with the Computer Measurement Group (CMG) [CW, Oct. 22] have scheduled meetings in December.

Northeast CMG, New York City, Dec. 8; meeting will plan the program and direction of this regional group for 1976; contact Barry Stevens at Peat, Marwick Mitchell & Co., 345 Park Ave., New York 10022.

Southern CMG, Nashville, Tenn., Dec. 8-9; presentations on networks, mass storage systems, direct access subsystems and the Amdahl 470; contact Larry Barnes, Room 203, Andrew Jackson State Office Building, Nashville 37219.

West Coast Measurement and Evaluation Group, San Francisco area, Dec. 10; presentations of computer performance evaluation products by vendors, election of local officers; contact Bruce Grant at Stauffer Chemical Co., MID Technical Services, P.O. Box 3050, San Francsico 94111.

Texas, Oklahoma and Kansas, Tulsa, Okla., Dec. 16; initial meeting at which Phil Kiviat, technical director of Fedsim, will speak; contact Bill Miller at American Airlines DP&CS, 3800 N. Mingo Road, Tulsa, 74151.

Package Aids Datasystem Users

TAMPA, Fla. – Support for easier data entry, updating, inquiry and report generation on Digital Equipment Corp. Datasystem 310s and 350s was the compound design goal of the Data Entry/Forms Generator package now available from Business Information Systems, Inc. (Bisi).

Comparing the capabilities of its package to those provided by DEC with the Datasystem 340, Bisi said it allows users to start building and working with data files "immediately," even before they become proficient in programming.

The format descriptor portion of the package enables the user to get up CRT screen displays designed to coach clerical personnel through the data entry operations of individual applications. A cursor leads the clerk to the next blank to be filled in and the display text shows what information is needed.

Internaliy, input is edited for valid field length, type of data (alpha, numeric or mixed), range of values and check-digit verification. Errors cause an audio signal and an error message, Bisi said.

Hash totals can be accumulated on as many as 10 fields for audit purposes. Meanwhile, automatic duplication reduces repetitive keying and the system allows initial values to be set so each processing run starts correctly.

Updating operations include retrieving, displaying, modifying any existing field and writing the record back to its original position. Both direct access of sorted files and sequential access for unsorted files are supported, the vendor said.

Under control of the instaliation management, display and updating capabilities may be open to all personnel with access to the system keyboard or limited to specific, presumably nonsensitive fields.

The Data Entry/Forms Generator is available under license for $1,000 for the first system and $500 for additional licenses from Bisi at 303D Whitehall Court, 33604.

Compact Conferences To Consider Concepts

NEW YORK – A series of one-day "state of the art" conferences in January will touch on many aspects of structured programming and open a dialog between participants and "five of the finest minds in the computer industry today;" according to Yourdon, Inc., which is sponsoring the meeting.

Planned for presentation in three cities – New York, Boston and Chicago – on consecutive days in mid-January, the conference will include presentations by Gerald Weinberg, Larry Constantine, William Plauger, Tom Plum and Ed Yourdon.

Author of *The Psychology of Computer Programming*, Weinberg will talk about programming teams and structured walkthroughs. Constantine is expected to touch on structured design and its impact on structured programming.

Plauger, coauthor with Brian Kernighan of *The Elements of Programming Style*, will focus on style and discuss, among other things, why eliminating GOTO statements does not ensure a readable program.

Serving primarily as moderator will be Plum, an author of various articles, including one on "remedial programming," and an associate of Weinberg's at Ethnotech, Inc. in Lincoln, Neb.

For his part, Yourdon will discuss the practical problems of implementing structured programming and the associated "programmer productivity" techniques in a typical DP installation.

Following each speaker there will be plenty of time for a question-and-answer period, the sponsor said, noting "after all, the subject of structured programming is not without controversy."

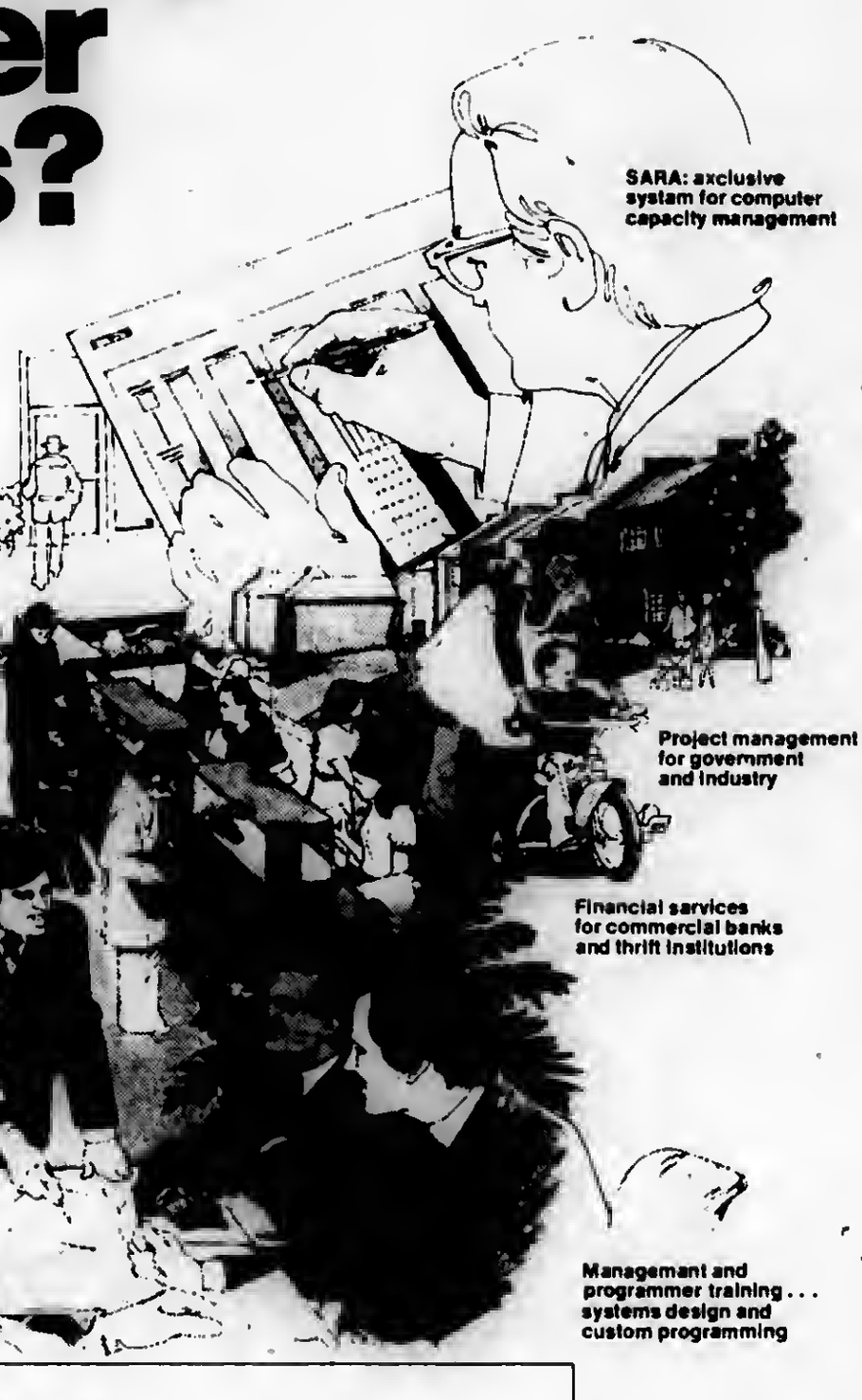
Attendance at any one of the three presentations of the conference, scheduled in New York on Jan. 19, Boston on Jan. 20 and Chicago on Jan. 21, costs $95.

Registration and inquiries are being handled by Yourdon, Inc., 1133 Ave. of the Americas, here in New York, 10036.

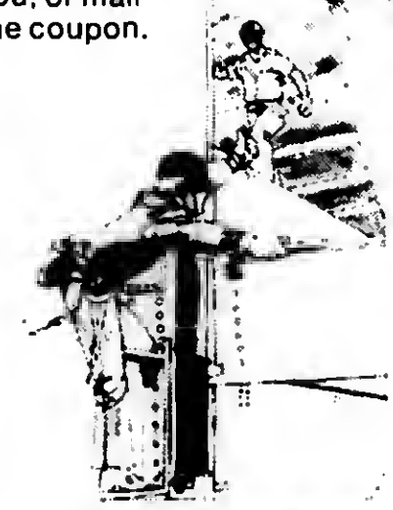
Clarification

The special issue of *Computing Surveys* cited by Daniel Couger in "Structured Program Guidelines Found in ACM Effort" [CW, Nov. 5] was dated December 1974. It is still available for $8 per copy from the Association for Computing Machinery, 1133 Ave. of the Americas, New York, N.Y. 10036.

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Manual Diagram, Generated List Of Paragraphs Seen Control Key

(Continued from Page 11)

developed by IBM or a similar technique, the lowest level of documentation required would consist of generally describing the function of a given program paragraph, leaving the detail definition to be the statements which make up the program paragraph.

In preparing the diagram, the programmer consults with the team leader (lead programmer) and management to evaluate not only the program design, but also the meaning of significance of the paragraph names.

Further, there is an attempt to improve the meaning of the total hierarchy to better describe the processing of the program. The functional hierarchy becomes the table of contents for the program and should describe each function of the program and show how each is related to the total structure.

This process becomes very powerful when the programming team has produced the documentation of a detailed analysis and will design, implement and document the new system. Having consistent function names throughout the development process and embedded in the programming system greatly enhances the total system documentation.

Because of the logical properties of a structured program, the hierarchy is computable. Since each reference point (paragraph name in Cobol) of a program has associated with it a span of control and each has a dependency relationship, it is a simple matter to develop an algorithm which produces the program hierarchy.

We developed a postcompiler system which analyzes the structure of a given program and outputs a paragraph structure report showing each reference point and its relationship to the entire program.

This, in concept, is identical to the functional diagram, but becomes more important since it is produced from the developed program. The manually-prepared functional diagram, therefore, becomes a historical document, and future reference to it may be for evaluation purposes only.

The computer-generated report represents the actual program contents and is always a current statement of the program documentation. If program functions are added or deleted, it is a simple matter to identify and modify the manual documentation.

```
03 GENERAL-UPDATE-PROGRAM
   02 INITIALIZATION-ROUTINE
   02 UPDATE-PROCESS
      03 WRITE-MASTER
         04 STORE-TOTAL-ACCUMULATION
         04 SELECT-NEXT-LOW-MASTER
            05 COMBINE-DUPLICATE-MASTERS
               06 COMBINE-DUP-MAST-SUB
               06 COMBINE-DUP-MAST-SUB
               06 COMBINE-DUP-MAST-SUB
               06 COMBINE-DUP-MAST-SUB
            05 MASTER-IN-SEQUENCE-CHECK
         04 MASTER-OUT-SEQUENCE-CHECK
      03 PROCESS-TRANSACTION
         04 UPDATE-MASTER
            05 DUP-MASTER-CREATION-ERROR
            05 UPDATE-MASTER-WITH-TRAN
               06 CREDIT-UPDATE
               06 DEBIT-UPDATE
```

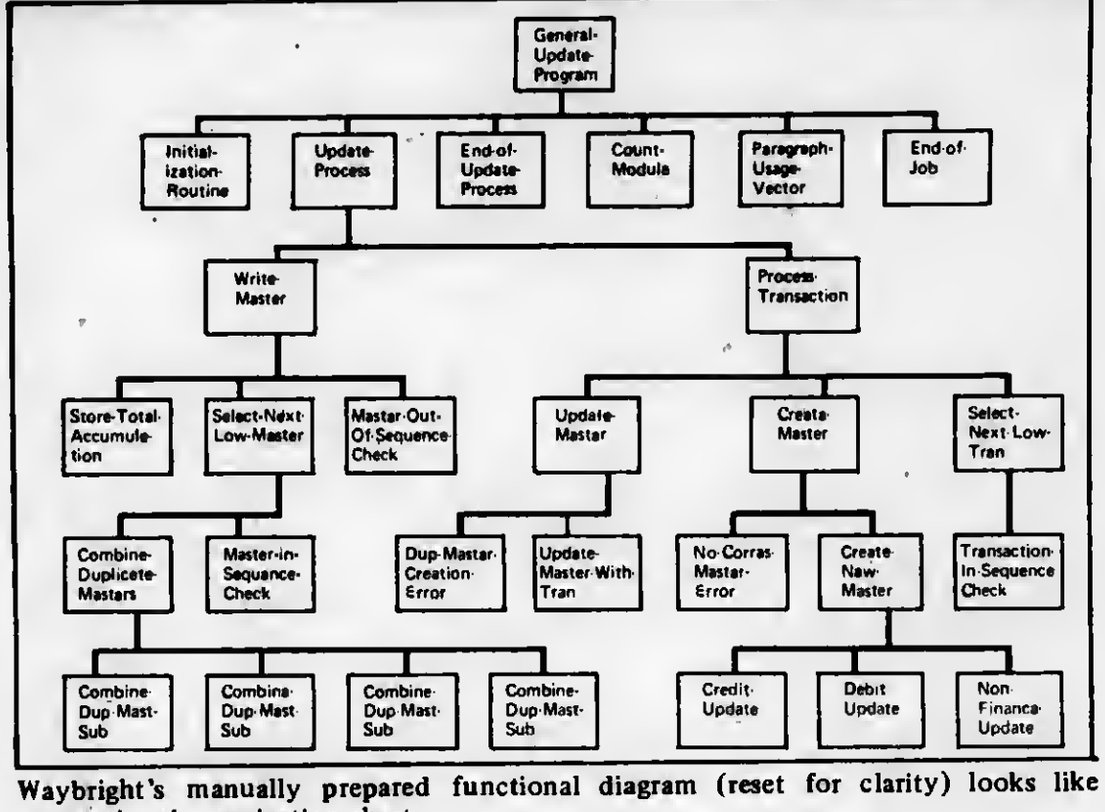
Partial output of postcompiler run shows dependency of paragraphs through indentations.

The majority of program maintenance requires modification of existing functions and adding or deleting entire functions without changing the basic design. The essence of the structured technique is that functions are logically related yet distinct entities.

With the hierarchy showing these functions (named exactly as they were in the manual documentation) and how they are related, the maintenance programmer is assured much greater success.

There are several other logical extentions of the program hierarchy and function/data element relationships which would support more sophisticated systems development techniques; however, more work is required to understand them.

Waybright is manager of technical support, Management Information Systems Department, Belk Stores Services, Charlotte, N.C.



Waybright's manually prepared functional diagram (reset for clarity) looks like conventional organization chart.



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And thousands of computer professionals will take advantage of this opportunity as the Caravan moves across the country. The '76 Caravan can expect attendance of over 30,000 computer professionals, and unlike any other computer show, significant numbers of attendees will come from each of 15 states and the District of Columbia -- representing 65% of all U.S. computer systems installed. That's true national coverage.

As a marketer of computer products and services, the Computer Caravan offers you a unique opportunity to meet the professionals who run our country's computer installations in a one-to-one, business oriented atmosphere. Because there are 27 different show days, no one Caravan day is too crowded to give you the opportunity to present your products or services in detail -either on our exhibit floor, or in your own product seminar. And the 1976 Caravan offers several innovations which can make it more suitable to your individual marketing problems:

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3. Data communications marketers can take advantage of our DATACOMM 76 add-on, which gives you a spot in the national data communications show sponsored by *The Data Communications User* magazine.

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COMMUNICATIONS

AT&T Devices on Phone Net Must Be Certified: FCC

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – AT&T equipment – as well as noncarrier equipment – must be certified and registered before it can be directly connected to the telephone network, the Federal Communications Commission (FCC) has decided.

That ruling was made in the commission's report and order issued recently to detail its decision allowing direct connection to the network [CW, Nov. 12].

AT&T is expected to object to this requirement, which marks the first time telephone company equipment will be required to undergo a validation process.

"We feel the FCC decision to extend the new registration requirements to equipment provided by the Bell System and other telephone companies is particularly ill-advised," an AT&T spokesman said.

"There is no logic whatsoever to the proposition that the regulated common carriers . . . should be arbitrarily required to submit their own equipment for government sanction," the spokesman added.

In its report and order detailing the events which contributed to the registration decision, the FCC said it had given the carriers ample opportunity to propose ways to "prevent harm without unduly restricting a customer's right to make reasonable use of the facilities and services furnished by the carrier. This the carriers have failed to do."

"The evidence before this commission amply demonstrates that many 'special' entities (e.g., gas, oil, electric and transportation companies, selected industrial firms, the Department of Defense, the National Aeronautics and Space Administration and customers in 'hazardous or inaccessible locations') have long been and continue to be allowed to connect their equipment and facilities directly to the telephone network by means less restrictive than carrier-provided connecting arrangements . . . apparently without causing harm to the network.

"We also note that there has been no demonstration of network harm resulting from the interconnected operation of some 1,600 independent local telephone companies and the Bell System . . . many of whom purchase and connect without benefit of carrier-supplied connecting arrangements the identical independently manufactured terminal equipment for which the individual user must lease carrier-supplied connecting arrangements," the FCC said.

The present AT&T tariffs requiring the use of Data Access Arrangements "impose an unnecessarily restrictive limitation on the customer . . . and constitute an unjust and unreasonable discrimination both among users and among suppliers of terminal equipment," the FCC said.

The certification/registration program scheduled to begin next April "will provide the necessary minimal protection against network harm which has been specified in various carrier operating procedures," according to the commission.

AT&T said the FCC's plan is "replete with technical and administrative shortcomings." As a result, AT&T has serious reservations about the ultimate impact of this decision on the quality and cost of telephone service, the spokesman said.

AT&T called the certification program "deficient in numerous aspects of network protection and the protection of customers and telephone company employees."

Asked whether AT&T would request reconsideration of the FCC decision, an AT&T spokesman said the commission's report was under study, but no decision on Bell's next step had been determined.

120,000 DAAs in Use

WASHINGTON, D.C. – After 72 months of interconnection, Bell System records provided to the Federal Communications Commission (FCC) at the end of 1974 showed about 80,000 Data Access Arrangements (DAA) had been installed.

This included about 22,000 manual (CDT) types and about 58,000 (CBS and CBT) types, an FCC spokesman said. Later cumulative totals were not available but, in the second quarter of 1975, Bell reported it had installed 6,062 CBTs, 4,349 CBSs and 1,398 CDTs.

Assuming these quarterly figures were typical for 1975, Bell probably installed another 40,000 DAAs of all types during the year. This means about 120,000 of the data couplers have been installed by the Bell System.

It is assumed Bell installed 90% of the total units in use with another 10% installed by the independent telephone companies, the FCC staff spokesman said.

An AT&T spokesman said the DAA totals had been furnished at the request of the FCC and the numbers could be provided only by a member of the commission. AT&T could not provide information on the amount of rental revenue that had been collected from the installation of DAAs, according to the spokesman.

NBS Aiming to Extend Government Networking

Special to Computerworld

WASHINGTON, D.C. – The National Bureau of Standards (NBS) Institute for Computer Sciences and Technology (ICST), under the direction of Dr. Ruth M. Davis, has been seeking to foster the wider use of networking in government to provide better services for citizens at lower cost.

"Our program is aimed at assisting agencies in selecting network services and using them effectively," she said.

Actually, the Federal government is already the nation's largest user of networking systems. Of the over 9,400 computer systems in use in government agencies, some 2,600 are already connected as a part of networks.

The fact that these 2,600 represent 60% of the dollar value of the federal computer inventory indicates that many of the networked systems are among the larger ones employed by federal agencies.

One of the recent NBS contributions in the networking area is the development of new measurement techniques for use in evaluating the service delivered by computer networks.

"By focusing on service delivered to the user, rather than on internal network performance, we can provide federal agencies with the information they need to procure the networking systems or services that best meet their individual needs," Dr. Marshall Abrams, an ICST engineer said. "Several agencies are planning to use our Network Measurement System during network system or service selection this year," he added.

Network standards and protocols are also an important part of the networking program, explained Ira Cotton, an NBS computer specialist. "Networking standards have been slow to develop in this country," he said.

"International groups are much further along in developing common ways of connecting users to networks and for interconnecting networks, even though much of the advanced networking technology was developed in this country." One of the problems is that communications engineers and computer specialists "don't speak the same language," he added.

"But I think we're getting over this problem, and we can expect to see some rapid progress."

Evaluating Solutions

NBS has also been active in proposing and evaluating solutions to problems that may impede effective network use, in areas such as network access and network security.

"Our network access project recognizes the problems end users have in speaking the language of computers," explained Tom Pyke, chief of the Computer Systems Engineering Division, in which the NBS networking program resides. "We have developed a minicomputer-based Network Access Machine (NAM) which executes complex network procedures in response to simple user commands."

Because NAM is implemented on a separate minicomputer, it can be used to access resources on many different networks, conforming to the unique protocols of each. The system is in experimental use within NBS and will be replicated soon for use by other groups.

Comshare TEC Corrects Errors For T/S Systems and Terminals

ANN ARBOR, Mich. – A hardware device from Comshare, Inc. reportedly provides error-free output from all Comshare time-sharing systems to asynchronous terinals operating at speeds up to 1,200 bit/sec.

Dubbed the Telegrid Error Controller (TEC), the hardware device is described as the first of its kind to extend error-detection capability to the terminal. Until now, according to the vendor, intelligent time-sharing networks performed error-checking functions only as far as the remote city node without addressing the problem of "local loop" communications reliability.

With the development of TEC, the user is assured his data is error-corrected at every point through his Bell local dial-up facilities right to the terminal, Comshare claimed.

The 1,200 bit/sec terminal user with TEC can reportedly utilize up to 60% of the speed of a 2,000 bit/sec terminal plus 100% of its error-control features at approximately 30% of the cost.

TEC costs $50/mo on a one-year lease. The purchase price is $1,500 per unit, with a monthly maintenance charge of $5.

Rental customers may accumulate purchase option credits at 50% of paid rentals, the firm said from 3001 S. State St., 48104.

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CRT Option Monitors Intershake Testers

ALEXANDRIA, Va. Atlantic Research Corp. has introduced a CRT monitor option for its Intershake line protocol simulator and tester.

The CRT allows visual text display of data messages and control characters. By using Intershake to activate and freeze the display of those characters or data blocks of interest, the capability of the 512-character screen is "magnified" to the equivalent of several thousand characters, the company said.

The CRT plugs directly into the parallel interface port already existing on all DTM Intershake units without requiring any modification. It is available in either rack-mountable or portable versions, Ascii or Ebcdic and with switch-selectable 115V/60Hz or 230V/50Hz power.

The Intershake CRT-DTM Option 18 is a programmable online monitor. It will display all transmit and receive data or can be programmed, via Intershake, to display only selected transmissions. It can display only the response of a selected terminal, display only the transmitted polls, display only protocol characters or display only received or transmitted text.

The user can freeze and display the last 512 characters after a selected event or error. When used off-line with Intershake, the CRT-DTM provides a CRT display for either simulating or testing a terminal.

The CRT costs $1,950 with 30-day delivery from 5390 Cherokee Ave., 22314.

Micom Controller Features Micro

CHATSWORTH, Calif. Micom Systems, Inc. has introduced the PCC 50/40 programmable communication controller, which incorporates a microcomputer.

The central control module contains all system elements necessary for an operational system including an 8K-byte memory, real-time clock, auto restart timer, I/O ports and microcomputer.

The microcomputer features vectored multilevel interrupts, unlimited subroutine nesting and direct memory access. Memory expansion is available to 64K bytes.

Asynchronous communication line interfaces are available with controls for use in many applications, including auto answer. Full displays of control lines and data with light-emitting diodes are provided on each module.

Interfaces include both RS-232 and CCITT V.24 synchronous at speeds up to 19.2 kbit/sec and asynchronous to 9,600 bit/sec. Optional modules permit interfacing to 20mA or 62.5 mA telegraph current loops, MIL-188, CCITT V.35 interfaces or Bell 302 and 801 series data sets.

The basic PCC 50/40 is priced at $2,000. Communication line interfaces are approximately $250/line. Micom is at 20426 Corisco St., 91311.

Digi-Log Brings Out Briefcase Telecomputer

HORSHAM, Pa. Telecomputer II, a briefcase CRT terminal, is available from Digi-Log Systems, Inc.

Standard and optional features make Telecomputer II interchangeable with Teletype models 33 and 35.

The terminal replaces the earlier models 209 and 33 portable interactive CRT terminals.

Expanded features include switch-selectable 40- or 80-character line length by 16 lines per display, for a total of 640 or 1,280 characters; built-in EIA RS-232 and current loop (20 ma and 60 ma) interfaces; and 15 switch-selectable rates, from 50- to 9,600 bit/sec.

Additional features include an optional built-in coupler and modem with switch-selectable transmission speeds of 10- and 30 char./sec and a 64-character Ascii code set.

Price for the basic terminal is $1,295; with acoustic coupler, 5-in. CRT and case, the price is $1,795. Lease programs are available and delivery is off-the-shelf from Babylon Road, 19044.

Data Set Runs at 9,600 Bit/Sec

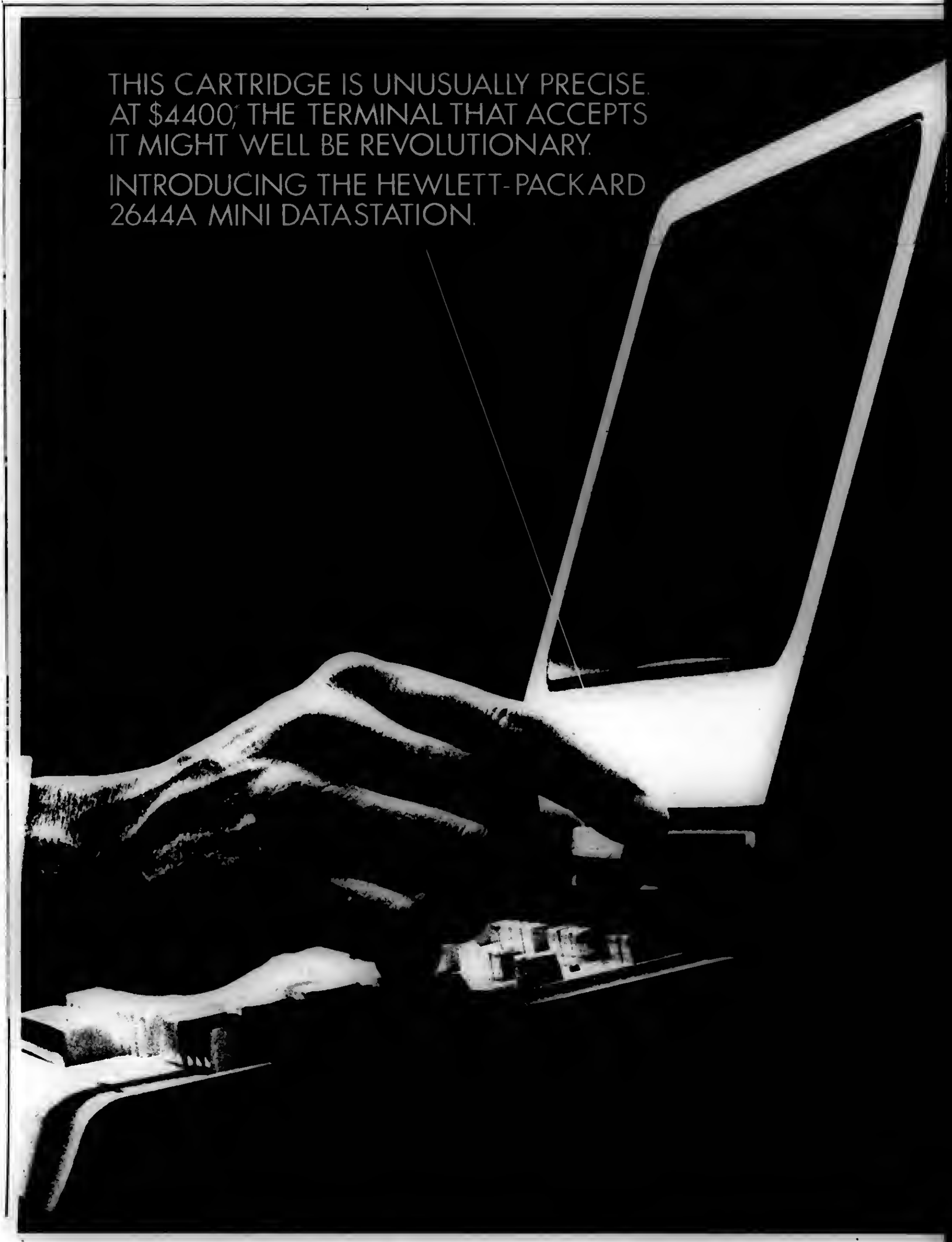
WILTON, Conn. – General Datacomm Industries, Inc. (GDC) has introduced a 9,600 bit/sec solid-state LSI data set.

The GDC 9600 data set is designed for operation on basic 3002-type private lines. It also provides for dial backup at 4,800 bit/sec over the dial-up network.

The data set is an all-digital implementation of advanced VSB modulation and equalization techniques using MOS-LSI and TTL circuitry.

The 9600 data set provides selectable 9,600-, 7,200- or 4,800 bit/sec serial, synchronous operation on unconditioned 3002-type private lines. It can operate with or without D1 conditioning. Standard features include clear-to-send delay, carrier detect, external/internal transmitter timing and mark hold on received data when carrier is lost.

The modem costs $7,900 with delivery in 30 days from 131 Danbury Road, 06897.



Distributed Processing Net Stretches Across Atlantic

COLUMBUS, Ohio – Industrial Nucleonics here has developed an unusual distributed data entry and processing network of Sycor Model 340 intelligent terminals which gives the corporation both local control of input and a centralized data base.

The data is input locally in Belgium and transmitted over voice-grade lines to an IBM 370/145 in Columbus for processing.

"The move to trans-Atlantic transmission was precipitated by the company's increasing level of overseas business," according to Frederic Rieger, manager of the methods department for the Ohio-based manufacturer of computerized process control systems.

"What at first was an acceptable charge for outside computer services became less acceptable as new systems were planned," he said.

More Economical Overall

When Rieger and his staff began the project early this year, the cost of computer processing time in Belgium was more than twice the comparable service in the U.S. Even at $3/min for communications facilities, Rieger reasoned, to transmit the information to Columbus for processing was more economical. It takes approximately 14 minutes to send a cassette tape of 1,400 80-byte records at 2,400 bit/sec.

Amortizing the purchasing price of the Model 340 terminal over a five-year period and adding in the cost of transmission time (but not including the cost of processing which is considered a nonincremental expense), Industrial Nucleonics found the cost could be contained well within the monthly overseas DP budget of $1,500, Rieger said.

Terminal Transactions

As more applications are added to the system, it will become even more cost-effective to lease a low-speed Telex or higher-speed alternate voice-grade data line, he said. That way, regardless of the usage, the cost will remain constant and considerably under that of price-per-minute transmission which the company is currently using.

No Loss of Control

Besides the prospect of saving money, Rieger believes his company has developed a workable data base without violating local control.

"And, because we are developing all the programs here and all the data is processed by the same system, we can better control the direction of our applications," he noted.

The company first tested the network in February with a Model 340 in Columbus and a Sycor-compatible terminal in Brussels. The test included an International Communications Corp. 2,400 bit/sec modem over standard dial-up telephone lines into Western Union International's Datel network.

Rieger attributed much of his company's success with the system to the state-of-the-art technology of the Belgian communications facilities. When minor transmission problems did occur, he added, they are usually overcome by the modem or the terminal's intelligence and its binary synchronous procedures.

The system has been operational since mid-October and performs all billing for rental, service and installment contracts on the stand-alone Model 340. It factors in terms and conditions on different agreements, totaling the value of any parts used, adding service charges and taxes and printing out invoices – items that were previously calculated manually.



Centronics Adds 300 Bit/Sec CRTs

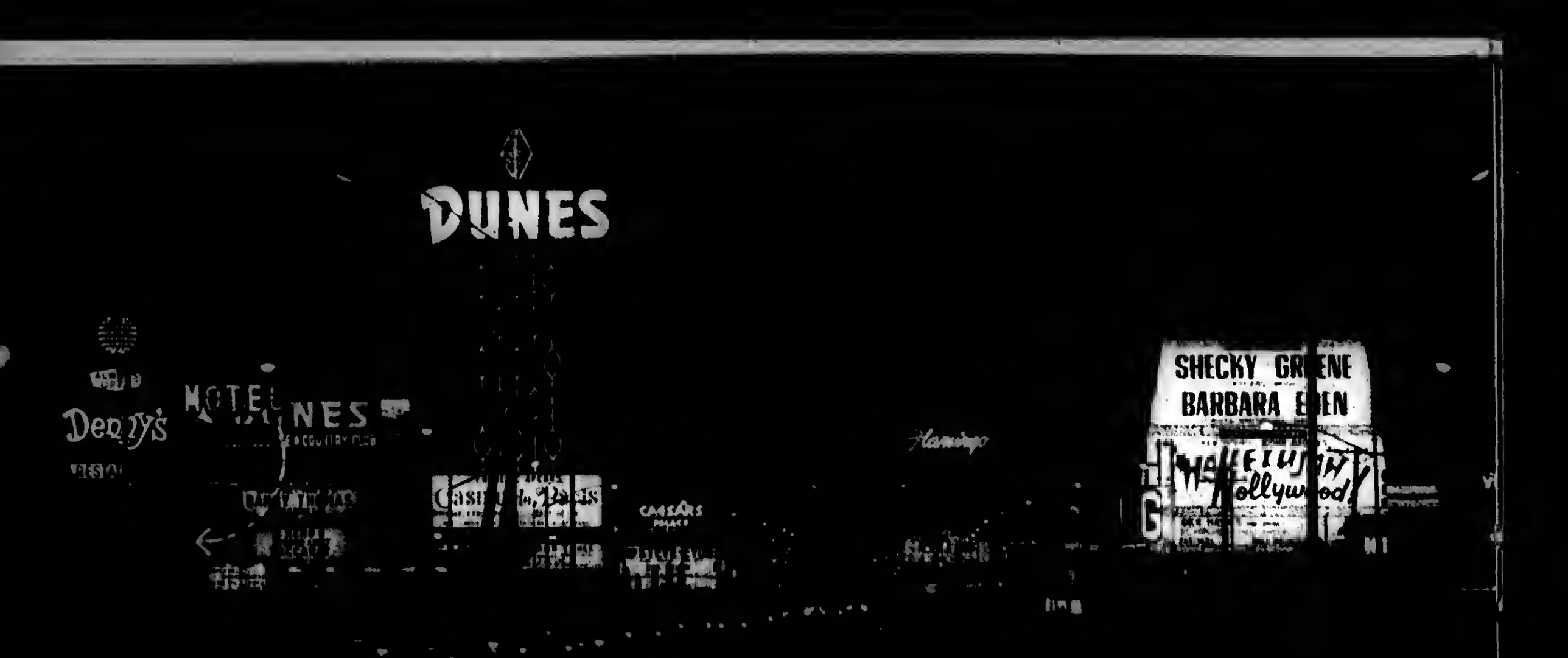
HUDSON, N.H. – Centronics Data Computer Corp. has added two telecommunications products – the models 330 and 530 teleprinter terminals – for 300 bit/sec users.

Both models provide 300 bit/sec throughput, 9 by 7 dot matrix character formation, elongated characters (boldface) for report headings and highlighting which carries through on multiple-part forms, parity error checking and adjustable tractor feed.

In addition to these features, the Model 530 provides wider forms capability (up to 14-7/8-in. wide) and 132 print positions. For the user who requires 132 print positions and can use 9-1/2-in. forms, a condensed print option on the Model 330 allows him to use the 330 at a lower price and still benefit from the 132-character line length.

The 330 and 530 teleprinters are available in receive-only (RO) and keyboard send/receive (KSR) configurations only.

The end-user prices for Model 330RO and 330KSR are $2,505 and $2,790 respectively. The Model 530RO and 530KSR cost $2,740 and $3,020 respectively.



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GRAHAM MAGNETICS

Savings May Reach $250,000

User Exchanges Saturated 370 for Less Costly 360

By Patrick Ward
Of the CW Staff

NEW YORK – "Money" was the simple reason the National Maritime Union's Pension & Welfare (P&W) Fund replaced its IBM 370/135 with a 360/40, according to John Reeps, operations manager.

When its rented 96K 370/135 became saturated, P&W decided the enhancements IBM advised would just cost too much money. So P&W returned the 370 and bought a 256K 360/40.

The move may save P&W as much as $250,000 over a three-year period, based on the 370's cost *before* enhancements, Reeps said.

P&W had been an early 370/135 user, first renting the machine from IBM in late 1973. The $15,600/mo computer ran varied batch applications and used IBM's Customer Information Control System (CICS) to handle on-line inquiries from four IBM 3270 CRTs.

But "it turned out the system wasn't big enough for the job," Reeps said.

IBM proposed adding another 48K and replacing the system's three 2319 spindles with two 3340 drives. The changes would have added about $2,500/mo to P&W's rent, a prospect that dismayed Reeps.

And the IBM proposal presented another problem. To accommodate the changes and continue running CICS, the shop would have had to abandon DOS Release 26 and convert to DOS/VS.

Alternatives Researched

P&W decided to look a little further. Leasing a 370 from a third party was one alternative but, at the time, third-party lessors wanted five- to seven-year contracts on 370s. P&W did not want to make that long a commitment.

The next thought was a 360/40, Reeps recalled. He had worked with one before and liked it. P&W also used a 30 before the move to the 135. Since his organization's workload was relatively stable, Reeps felt a 40 could handle the job.

P&W talked with about a dozen vendors who offered two- and three-year lease plans on 40s. Some of these lessors offered systems that cost $6,000/mo less than the 135, Reeps said.

After some further calculation, however, P&W decided purchasing would be more economical.

"We felt the value of [the 360/40] wouldn't fall that much in three years," Reeps said. "And if we owned it we could depreciate it."

P&W chose to buy the machine from Talcott Computer Leasing. "The price was competitive. Talcott had its own software people, and it is connected with the Computer Lessors Association [CLA], which gives some support under DOS," he said.

The Talcott package included a 256K CPU, a 1403 N1 printer, a 2540 reader punch, 2401 tape drives and eight spindles of 2314 disks.

Weekend Switchover

The switch from the 370 to the 360 took place over a weekend a year ago. The shop had about 95% of its applications operational by the following Monday.

Only one presented a problem. Talcott people eventually traced it to a CLA fix "that wasn't completely successful." Reeps said.

P&W found little real throughput difference between the 135 and the 40. While the 135 was faster, P&W applications are predominantly I/O-bound and the CPU speed doesn't make that much of a difference.

Bringing in the slower 360/40 meant "perhaps a 5% to 8% increase in the time required to do a week's work," Reeps estimated.

The 360, however, offers P&W the additional core and disk to handle growth, he noted.

The shop decided to switch from CICS to Westinghouse's Westi communications monitor about the time it changed mainframes, Reeps said. "We feel [the Westinghouse product] is more appropriate to our size and less core-expensive," he explained.

Westi occupies 24K in the 40, half as much as CICS took on the 135, he said.

As for keeping up with technology, Reeps feels his company's workload is stable enough and the 40's growth capacity large enough so the need for a new CPU will not arise for quite a while.

Drum Alternate, 158/168 Memory on Way

NEWTON, Mass. – Add-on memory manufacturers are considering making core or semiconductor equivalents to IBM's 2305 fast-access drum, according to interviews with several vendors.

Many memory vendors also said they plan to introduce semiconductor add-on memory for IBM's 370/158 and 370/168 in the coming year.

The IBM 2305 is typically used to provide a page-swapping area in virtual memory sites. It can also store frequently used utility software and perform buffering and queueing tasks, according to a spokesman for Intel.

However, "the price/performance of the 2305 hasn't been great," the spokesman said. A core or semiconductor product would have much higher performance and reliability for about the same price, he said. The other memory vendors agreed with him.

Some users could expect that a 2305 device might bring a 20% system throughput gain to their sites, the Intel spokesman said. The gain would be in the 10% area if the user already had heen using a 2305, he said.

The advantage of this type of device over the alternative of putting more add-on memory onto a computer system is that the 2305-compatible box could provide five times as much storage for the same price, the spokesman said.

However, these throughput benefits would vary considerably among different users, he noted.

Intel is "halfway between considering and announcing such a product," the spokesman said.

EMM Computer Products is also evaluating the possibility of a 2305 replacement, but has not decided one way or another, according to Wayne R. Brumm, product manager of the systems equipment operation.

But a drum replacement is "very definitely coming from Ampex next year, according to Al Sroka, manager of the company's Memory Products Division.

IBM 370/168 users can expect to find Intel offering semiconductor add-on memory for that machine in the second quarter, the Intel spokesman said.

EMM sees 168 add-on memory as a definite possibility for late 1976, Brumm noted. That company plans to announce semiconductor memory for the 158 about the end of this year.

EMM will also bring out 370/135 add-on memory toward mid-1976.

"We're looking at offering a product with a 2M-byte capacity – four times the IBM limit," he said.

EMM is also evaluating field enhancements that would boost the speed of 360/65 and 370/155 add-on memories by 10% to 15%, he said.

Asked why users typically resort to add-on memory, the vendors tended to point to IBM's Customer Information Control System (CICS), and to VS.

"We love to see a user go to CICS because very shortly he will pick up more memory," the Intel spokesman said.

VS, with its paging requirements, also leads a lot of users to add more memory, Brumm remarked.

Itel Has 168 Add-On Memory

SAN FRANCISCO – Itel Corp. has brought out an IBM 370/168 add-on memory for end users.

The Itel 168 Monolithic Main Memory (MMM) uses 4K random-access memory (RAM) chips that are said to reduce the number of components per memory size and provide "superior reliability."

Starting from any IBM memory size, Itel's 168 MMM can be added in 1M-byte increments to a system total of 8M bytes.

The 168 MMM is fully compatible with IBM 370/168 Model 1s and Model 3s and multiprocessor models, Itel said.

Although an Itel spokeswoman said pricing is not yet finalized, she predicted the memory will cost "from 10% to 50%" less than the IBM list price.

First shipments of the memory are set to start in January from the firm at One Embarcadero Center, 94111.

CDC Plans Larger, Upward-Compatible Machines

ATLANTA – Control Data Corp. users can continue to expect new and larger mainframes from their vendor.

That was the gist of remarks John V. Titsworth, CDC executive vice-president, made at a recent users meeting here.

CDC will continue to focus on building computers for large engineering and scientific users, he said.

The company is working on development of standard product lines, with particular emphasis on maintaining operating software that will be compatible with currently available CDC machines, he added.

CDC's plans call for systems that can perform 20M to 60M floating-point operation/sec, a rate five to 10 times faster than that which today's top-of-the-line Cyber 76 model can offer, Titsworth said.

These machines will "meet ever-increasing user requirements for better data management capabilities, input/output controls and faster and larger computational facilities," he said.

"We have placed highest priority on developing a technically simple and economic migration path to new systems," Titsworth said. "A file system common to standard systems and computational facilities and new systems product lines is receiving special attention."

Top 170 in the Works

CDC is in the final development stage of a project that would place a 7600-class machine at the top of the company's Cyber 170 line, Titsworth said.

The 7600, a large-scale system typically used in engineering and scientific environments, is twice as powerful as the current top-of-the-line 170 series models, a CDC spokesman noted.

The model CDC is planning would fill the gap between these model lines, the spokesman said.

CDC also has enhancements to its Star system under way, Titsworth said. The Star, used in "extremely large engineering and science environments," has a bandwidth of 1.6G byte/sec, compared with the 383M byte/sec bandwidth of the CDC 7600, he said.

"In addition to new semiconductor memory and other changes to improve [Star] performance, we are implementing a Cyber 170 front end for Star," Titsworth said.

The front end will handle conventional DP, leaving the Star free to concentrate on the types of problems it can handle best, Titsworth concluded.

Broomall Graphics Systems End Need to Exhibit Step Functions

BROOMALL, Pa. – The 930 series of graphics systems from Broomall Industries is comprised of continuous rather than incremental computer/plotter systems that can draw straight or curved lines without exhibiting step functions.

Data base creation, maintenance and overall system operation are handled by the systems' integral processor, Broomall said.

A full range of peripherals includes input modules such as magnetic tape cassettes and other tape units, punched cards, paper tape, digitizers, CRT devices and a teletypewriter.

Applications include charts, maps, plots, plant design, conversion, highway design, graphs, network layout, schematic drawings, printed circuits and layouts, Broomall said.

The system can be expanded to include multiple plotters, batch processing, foreground/background operations and real-time processing, Broomall said.

A software library, mostly based on Fortran programs, is available.

The System 930/100 costs $59,000. The System 930/200, with a larger plotting area, costs $75,800. The prices include plotter, computer and basic software and hardware.

Broomall is at 682 Parkway, 19008.

First MSS Seen Economical for Large-Scale Users Only

By Patrick Ward
Of the CW Staff

REDWOOD CITY, Calif. – Only large-scale mainframe users will find the first commercial mass-storage systems (MSS) economical, but, in these shops, these systems will be able to cut both batch and on-line processing costs, according to Erik Salbu, mass storage systems marketing manager for Ampex Corp.

Ampex plans to begin shipping its Terabit system to commercial users early next year. The device offers from 11 billion to 350 billion bytes of storage and wili interface IBM 370/155s and up under either OS/MVT or virtual operating systems. The Ampex device also interfaces Control Data Corp. (CDC) 7600s and 6600s and Digital Equipment Corp. Decsystem 10s.

Less expensive mass storage units for the 370/145-level user are about two years away, Salbu predicted.

How will mass storage save the large-scale users money? Consider that the typical buyer will have 4,000 to 5,000 tapes in his library, Salbu said.

"In that type of batch-processing environment, mass storage is really a tape library replacement and can be cost-justified as such," he said.

Users currently spend about $2/tape mount, with about a third of the cost in tape drives and controllers, a third in operators and a third in tape library facilities and management, he said.

If the typical shop mounts about 10% of its tape library/day, the user with 5,000 tapes spends $1,000/day or $30,000/mo on his current system, Salbu said.

With that amount of money, the user can buy a mass storage system and avoid handling errors and delays and improve security, Salbu said.

But mass storage systems can also double as a vehicle for on-line data base applications, Salbu added. Interactive users can switch a percentage of their on-line files from disks to lower cost, lower speed mass storage, he explained.

This could be especially appropriate in a shop handling interactive applications under IBM's VM/370 operating system, he said.

In this case, the data center may be keeping up to 20 times as much data on-line as its terminal users require at any one time, Salbu remarked.

Rather than storing every interactive user's data base on disk, the DP center could program the mainframe to bring the data base from mass storage while the interactive user was logging in, he said.

Mass storage is too slow to have much of an impact on an interactive, IMS-type data base that supports a wide range of terminal users, he said. It can, however, serve as a dump/restore facility for that user, he said.

Honeywell TDC With Micros Controls Industrial Processes

FORT WASHINGTON, Pa. – Honeywell's Process Control Division has introduced a control system architecture – Total Distributed Control (TDC) – that is said to have the design flexibility to handle industrial processes of any size or complexity.

Called the TDC 2000, the system integrates microprocessor controllers, stand-alone CRT stations and a coaxial cable "highway" for information transfer.

More than $1 million can be saved in installing a large system since "miles" of wiring are eliminated through use of the coaxial cable, Honeywell estimated.

The basic element of TDC 2000 is a digital controller using microprocessor technology. The controller is configurable on-line by push-button to perform any combination of eight control functions from 28 equations.

Conventional operator interface can be obtained with a complete range of panel-mounted analog displays. A keyboard on the data entry panel provides displays for interrogation and configuration of the controller.

The operator station also uses a microprocessor and makes available all control information on a CRT display. The station may be used as a stand-alone display or as part of a centralized control console.

When higher level digital and supervisory control are needed, either of two process computer systems – HS716 and HS4400 – with appropriate Honeywell software support are available.

Data acquisition is provided by a process interface unit which communicates with the computer over the data highway and can be located up to 5,000 feet away from the highway traffic director.

TDC 2000 system prices begin at $15,000 from the firm at 1100 Virginia Drive, 19034.

Tab Products Designs Floppy Storage Units

PALO ALTO, Calif. – Tab Products Co. has introduced two storage alternatives for floppy disk users.

The Hang/50 storage module is a filing suit that suspends up to 50 floppies in plastic jackets attached to metal hangers. This keeps each floppy in a straight vertical position, preventing warp and sag that can lead to wear problems, Tab said.

Each jacket is indexed. The Hang/50 module itself is lockable, Tab noted.

Tab plans to ship its own floppies to users in a two-ring binder with protective vinyl sleeves for each disk. Called the Flip-Floppy, the package holds up to 10 floppies and includes index cards and a sequential numeric/color coding system.

The Hang/50 storage module costs $74.50. The Flip-Floppy binder, sleeve and coding system costs $14.95 (without diskettes) from the firm at 2690 Hanover St., 94304.

Correction

Further information on the IEEE Computer Society's second mass storage workshop [CW, Nov. 5] is available from the chairman, David N. Freeman, at Ketron, Inc., 530 E. Swedesford Road, Wayne, Pa. 19087.

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For Products With Fluctuating Demand

System Balances Firm's Manufacturing, Marketing

By Harry B. Solmson
Special to Computerworld

Special problems exist in the proprietary medicines, toiletries and cosmetics business – problems of fulfilling widely fluctuating market demand requirements on hundreds of diverse products with similarly fluctuating inventories.

To meet these special problems, Plough Inc. has set up on-line computer systems that are helping control the handling of customer orders, production and inventory, while making each responsive to the other.

This problem of balancing marketing and manufacturing is especially acute for several reasons. For example, many of Plough's products – like Coppertone, Sudden Tan and Solarcaine – are seasonal in nature, requiring high production and inventories only during certain times of the year.

The on-line computer systems have helped company sales volume rise and have helped bring the inventory-to-sales ratio down at least 15%.

Customer service level is higher and order turnaround time is shorter. Cost savings from reduced inventory investment and more economical production scheduling are substantial.

The key to the DP contribution is a data base approach coupled with on-line communications techniques. "The data base provides the central repository for data essential to the operation of the business and a common information source serving management and operating personnel at all levels and in all functions," John A. Meade, director of Information Systems, explained.

"On-line communications instantly updates the data base to reflect the current situation and makes pertinent, timely information readily available to whoever needs it."

The control computer for the on-line systems – an IBM 370/155 – is located at the company's Memphis, Tenn., headquarters and main manufacturing plant.

On-line to the computer for both data update and information retrieval are some 40 3270 CRTs.

These are located in several departments: order entry, shipping and receiving, credit and customer service, inventory planning and production scheduling, purchasing, package engineering, research and accounting.

In addition, IBM System 3s are on-line to the central computer at each of the Plough distribution warehouses in Memphis, Miami, Los Angeles, Chicago and Carteret, N.J.

Critical Systems

The most critical on-line systems, in terms of contribution to manufacturing and marketing balance, are the inventory and production control system and the order entry system.

Several files in the on-line inventory and production control system are major segments of the Plough data base – principally the open-order file, the inventory file, the bill-of-material file and the production standards file.

In effect, the open-door file tells inventory planners what current product requirements are.

This file lists stock on hand and committed at each of the five Plough warehouses. It also shows product movement history during the previous 24 months, forecasted demand and scheduled production for the next 12 months and the finished-goods allocation plan for the upcoming 30 days – all by one of 11,000 stock-keeping unit numbers.

After production items and quantities are determined, the bill-of-material file tells inventory planners how to make and package the needed products.

"Fresh information flows into the data base via the 3270 terminals as transactions occur," Meade explained.

"Order entry, for instance, updates both current product requirements and on-hand, committed and available inventory data. Changes in sales forecasts update the forecasted product demand data, and the release of new production orders updates scheduled production data.

Purchase order issuance updates materials-on-order data. When a product allocation moves to a warehouse from the plant, receipt is entered immediately via the terminal in warehouse receiving.

When a shipment moves out of a warehouse to a customer, the shipping notice is entered via a terminal.

Drawing upon the data base record files, the central computer produces what amounts to a weekly "position paper" showing product requirements vs. inventory availabilities.

In addition, the computer produces a weekly requirements plan, exploded through all bill levels, to show what is needed, how much and when at every level of production.

All orders (averaging about 1,000 a day) come into Memphis headquarters and are entered on-line, as received, via the central order group's 3270 terminals.

Depending upon the particular order requirements, the terminal operator simply hits a code key to call up a visual screen display of all items within a particular product line.

Running down the screen display, the terminal operator simply keys in the order quantity adjacent to the appropriate item. He does not need to enter any product identity, only the quantity needed.

Updates Records

Once it accepts the customer, item and quantity entry, the system updates related file records – on the customer, order and inventory files, adjusting requirements and availabilities by finished product and through the various bill levels.

When a customer order leaves the warehouse, notification of shipment is transmitted back from the warehouse System/3 to the headquarters computer.

Also, the central computer will follow up on any order status where notification of shipment does not come back within 48 hours.

Solmson is president of Plough, Inc. in Memphis, Tenn.

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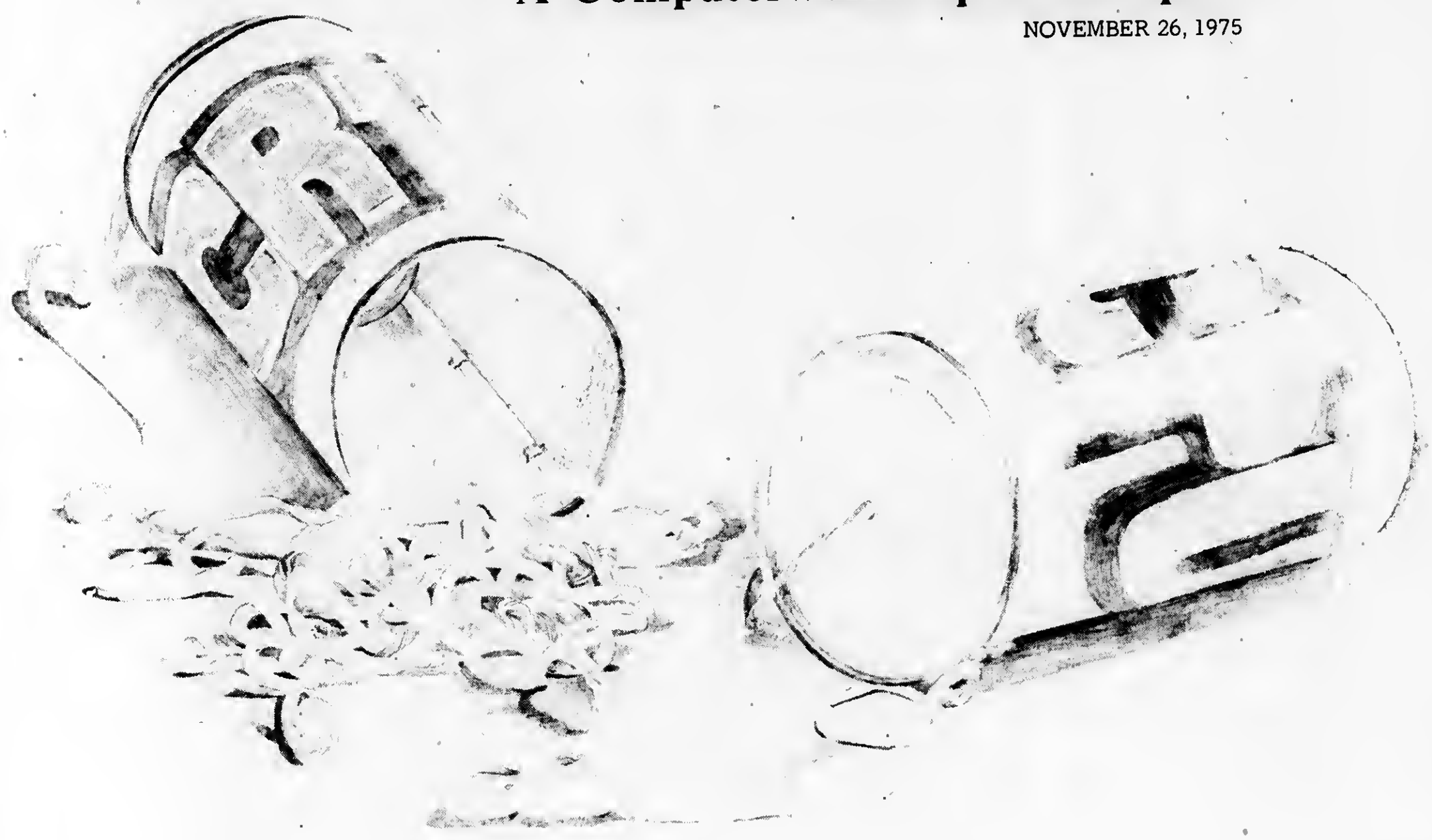
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Unraveling Data Networks

A Computerworld Special Report

NOVEMBER 26, 1975



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This special report was prepared under the direction of Ronald A. Frank, CW associate editor/technical news. Cover art by Cynthia L. Kintzer.

Within Past Six Months

Data Communications Options Continue to Proliferate

By Dixon R. Doll
Special to Computerworld

Within the past six months, many of the traditional promises of new services for users have become reality.

Domestic satellite channels from Western Union, American Satellite and RCA are now being employed for various data communications applications. Also the value-added carrier networks have begun operation with the initial service from Telenet Communications Corp.

Specialized carriers like MCI Telecommunications Corp. and Southern Pacific Communications continue to expand service to data users with traditional analog offerings using modems, on the one hand. On the other hand, digital switched services from Data Transmission Corp. (Datran) are now being used with increasing regularity.

In addition, users are now in a position to plan for Bell System Dataphone Digital Service (DDS) with certain specific price advantages and a larger number of geographic locations for service. This is in spite of the confused two-tier DDS pricing structure "temporarily" in effect.

Many design alternatives which were only available on paper as recently as a year ago have started to become a reality. The traditional approaches to configuring a network must now be blended with new and complementary procedures for designing networks which contain a mixture of both the traditional and more recently available services.

As an example, consider the value-added carrier offerings. The user who is now involved with designing a leased-line network and operating it and maintaining it turns over full responsibility for those functions to the value-added carrier.

From the user's standpoint, there is no further worry about minimizing line costs, assuming the value-added service provides coverage to all user locations.

In the next year or two, most users will want to get their learning curve established on a reasonably low-risk basis. For example, many companies are considering the use of individual DDS lines, individual specialized carrier lines, individual satellite channels or a small amount of packet-switching service as a way of initially understanding the impacts of such services on their existing networks. As the users develop a familiarity with the differences in these new services, they will make decisions to either expand the realm of coverage or to terminate the service altogether.

One of the problems the user must face is a decision regarding the best blend of traditional services and the new services (satellite, DDS, specialized carrier and value-added carrier) which will be of most significant benefit to him.

To be sure, most users will not be able to justify using all of them. The problems of dealing with half a dozen carriers will tend to increase the administrative burden to the point of diminishing returns in comparison with dealing with perhaps only two or three vendors whose services provide the greatest networking benefit.

User-Sensitive Pricing

Users are also increasingly concerned about using traditional services with usage-sensitive pricing structure such as Direct Distance Dial. Many of them got burned very badly in March of this year when the Bell System changed its pricing structures significantly.

Continued reliance upon traditional services, especially those in the monopoly area, will place the user at the mercy of the vendor offering such service. Also, it will give the user virtually no predictability in the cost of operating his network.

The value-added carriers, of course, have a usage-sensitive element of their pricing structure which must be considered. However, for the next year or two it would appear that most users will need to be most concerned about the fixed costs of initially establishing a relationship with a value-added carrier.

The value-added carrier service offering will have a pricing structure which depends on the following rate components:

- Any local distribution charges for connecting the user terminals to the value-added carrier's minicomputer in the serving city.
- Any dedicated ports either dial or leased on that minicomputer for which the individual user must pay.
- Costs for access line to host computers.
- A connect charge in cases where dial-up access is made from user terminals into shared public ports in the value-added carrier offices.
- The usage-sensitive element known as the packet charge.

Obviously, the correct way to approach the evaluation of such an offering will be to objectively compare all of the appropriate rate elements for using a packet-switching system with the current alternatives based on other approaches.

Applications Trends

An increasing number of users now want to consolidate multiple applications onto the same physical communication lines. For example, many users operating some type of data collection or remote job-entry (RJE) batch network are finding more and more ways to overlay their on-line requirements in the same physical communications network.

This has to a great extent been accomplished using hardware devices such as split-stream modems and multiplexers to allow individual physical lines to provide more than one independent channel to these various applications.

(Continued on Page S/6)

Bell's Claims for DDS Unsubstantiated

By David L. Lyon
Special to Computerworld

If the Bell System is right, Digital Dataphone Service (DDS) is the best thing to happen to data communications since telephone lines.

According to the people at Bell, DDS is cheaper than current analog service (modems and voice-grade lines) and offers communications users better performance as well.

Organizations such as the Independent Data Communications Manufacturers Association (IDCMA) and officials at Data Transmission Corp. (Datran), one of the independent carriers, have taken exception to these claims. Both groups have filed formal objections to Bell's performance claims and pricing policy before the Federal Communications Commission (FCC).

Amid the charges and countercharges, one thing is painfully clear: Now is not the best time to run out to your computer room and unplug your modems.

The Bell System is working hard to make DDS seem less expensive than analog service. The fact is, however, the actual tariffs may not be settled for years.

Currently in the thick of a legal tangle concerning DDS tariffs, the FCC is making Bell add new cities to its DDS under the existing tariff for private-line service (Tariff 260) at rates comparable to those charged for analog services.

Tariff 267, the current DDS tariff, now applies only to the original five cities of the DDS network. (That means DDS isn't chaper than analog service in most places and may never be).

Moreover, the FCC is studying Bell's overall pricing and claims by the Bell System that DDS is a new, distinct class of service. No firm decisions are expected before the beginning of next year. Even then, dissatisfied users or competitors may file suite in a federal district court to block the new tariffs and further delay a pricing decision.

As regulation piles on regulation and the legal smoke thickens, it is interesting to analyze the cornerstone of Bell's pricing policy: the incremental cost of using Data Under Voice (DUV) signaling over analog radio links. Using incremental costing, the DDS rates go up only when the cost of equipment and services used exclusively for DDS goes up.

This pricing policy can make for some startling inequities (and awesome power to stifle competition), because DDS shares so much equipment and plant space with other AT&T services. Bell could effectively subsidize DDS rates with revenue from other AT&T divisions forever, if necessary.

Even if the incremental costing procedure is allowed by the FCC (in the face of some stern opposition) the question becomes: What happens when the relatively low capacity of the DUV channel is filled and Bell is forced to use the normal, "high-priced" frequency bands of the same analog radio links?

Will Bell automatically raise the price for such overflow service? Or will the Bell System prorate such higher cost service over the entire spectrum of offerings so all users share the burden equally? So far

(Continued on Page S/8)

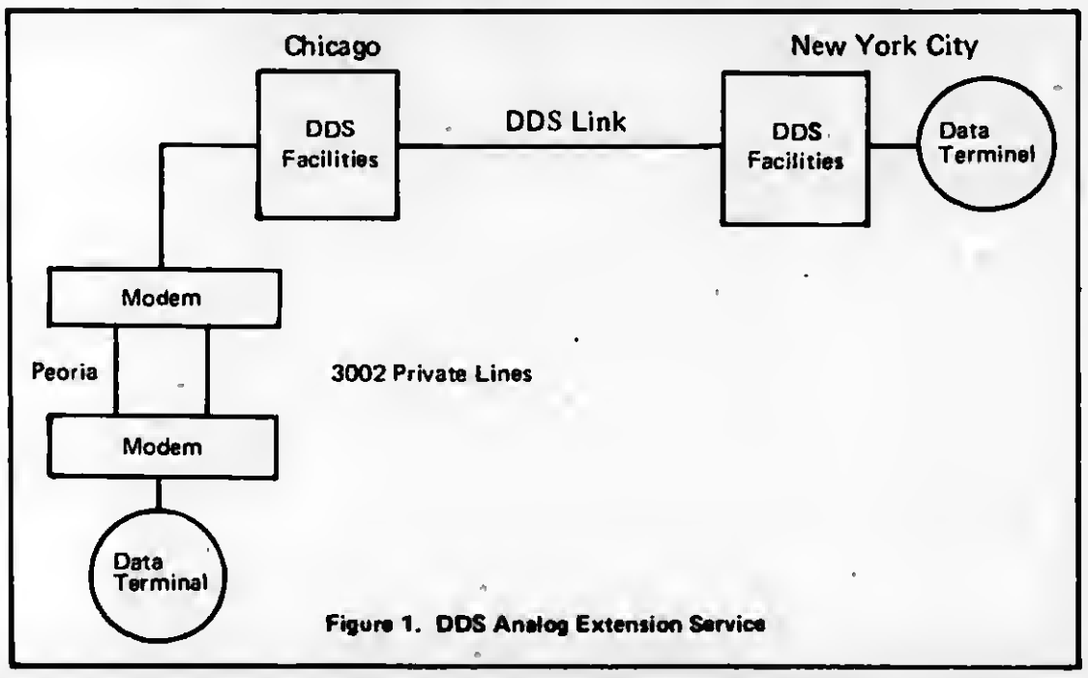


Figure 1. DDS Analog Extension Service

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Communications Standards Provide Plan for Future

By John L. Wheeler
Special to Computerworld

Data communication standards have a unique role compared with most standards in use in the world today.

While many standards, such as building codes, electrical safety and raw material dimensions, are a precise record of the way a certain function has been provided as a result of long use and experience, data communication standards instead provide a plan for the future.

Data communication systems, with requirements for complete and detailed worldwide compatibility, reliability and flexibility could never be built and made to operate without this plan for the future.

Data communication standards are different because they must be developed and agreed to before the first system is built and because they must be continually updated and improved through use and experience.

These standards are applied to digital data links and to networks, each made up of a number of data links and switching nodes.

There are two basically different types of data systems. One makes use of voice facilities specially adapted to carry data signals. The other uses purely digital facilities designed only for the transmission of data signals.

These two types of systems are quite different in the way the network is operated and controlled.

An analog or voice telephone network utilizes a distinctive dial pulse or dual-tone multifrequency (push-button) method for address signaling.

The data is transmitted through the network using either conventional or special modems, which adapt the data signals to match the analog characteristics of the network intended for voice communication. Thus, two completely different methods are used for network address control and for data transmission.

In a digital data network. the addresses of the called parties are entered into the system for address control in the same way as the data itself. The only difference between the network address control signals is the time at which they occur.

Because different methods are used for control of analog voice and digital data networks, the standards for such control are different. The basic functions and operations are the same, but the codes and signal characteristics are selected to match the need.

In either application, the network can be a private or dedicated facility made up of lines leased with a common carrier such as AT&T or Western Union for use by one customer with limited access, or the network can be a public facility with access offered to anyone who requests it and pays for its use. This distinction between private and public networks is not a technical one. There is very little difference in the compatiblity standards needed in each case.

An example of a typical data communication network is shown in Figure 1. It is made up of only three elements. These are user terminals, the links which carry signals between terminals and the nodes or switching centers which connect the links.

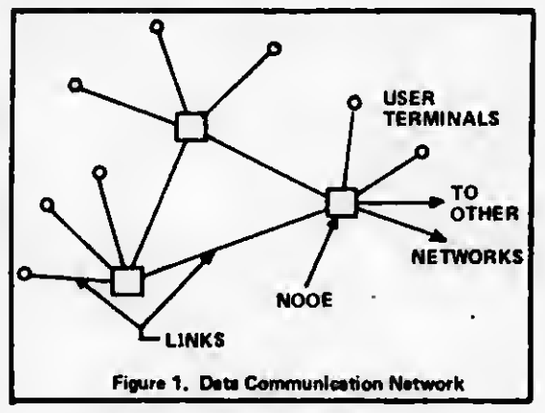


Figure 1. Data Communication Network

Two individual networks may be connected as shown in Figure 2. These may be two domestic networks in the same country or in two different countries.

(Continued on Page S/15)

Remote Processing Trend Responsible

Intelligent Terminals Fastest Growing DP Area

By David C. Seigle
Special to Computerworld

The intelligent terminal area has been one of the fastest growing segments of the industry. A driving force behind its growth has been the implementation of remote or distributed processing in user information networks.

In its broadest sense, distributed processing includes remote data entry as well as data manipulation; and, since the early 1970s, users have applied terminals to the data-entry aspect of remote processing.

Now more is being demanded of remote facilities, and intelligent terminals are becoming more sophisticated in their ability to process as well as edit and transmit data.

Because of the power of microprocessors to drive intelligent terminals, this processing power extends well beyond the device's capabilities to do editing normally associated with the data-entry function and considerably past simple input/output operations.

Resident software control can provide a multitasking environment in which concurrent jobs may be run. The software can, for instance, permit data entry to proceeed at the same time that files are being received and printed from the central processing unit.

By adding a disk drive, the user can enhance his data-entry applications by storing important data at his remote site and accessing and inserting that data into keyed records. He can also ensure the maintenance of his files or use the disks for inquiry/response applications, giving him, in effect, the power of a minicomputer-based processor.

This then represents the most sophisticated use of intelligent terminals in remote processing systems: as data entry or inquiry/response is being performed in the foreground, concurrent processing is taking place in the background, allowing communications, file maintenance or transfer or printing to take place without interfering with the terminal operator.

Although the intelligent terminal has the potential of filling a large role in remote processing networks, there are, of course, limits to its use.

The intelligent terminal is, after all, a single key-entry station which has the power to support various peripheral devices including random-access devices being used concurrently with data entry. This capability fulfills the needs of a remote site with limited data-entry requirements.

However, when a large number of single key-entry devices are required at a single site, intelligent terminals compare unfavorably with clustered key-entry systems on a price/keyboard basis. Also at such sites, the most advantage may be gained from terminals only when they have access to shared files for inquiry/response purposes or for current information lookup during data entry.

Moreover, the cost of unshareable peripheral devices such as magnetic tape drives, card readers, printers and even communications on a single display intelligent terminal limits the practicality of having multiple intelligent terminals at one remote site.

Clustered Systems

On clustered systems, the cost and use of these options may, of course, be shared. Even the printer can be shared by using multiterminal printer support which allows each display to interleave data blocks to one printer as data is being key-entered.

Another significant advantage of clustered systems is having files available locally to be shared among several op-

(Continued on Page S/8)

Study of Nets Proves Useful to Potential Users

By David C. Wood
Special to Computerworld

This article surveys eight packet-switching networks, identifying the capabilities provided by each and reporting the economic analyses, if any, which show the networks' cost-effectiveness.

The networks are characterizcd from the viewpoint of a potential user who might wish to access the network from a computer or terminal.

The user-oriented capabilities provided by the network are identified; requirements for interfacing the user's computer or terminal to the network are shown; and trade-offs of using the network are discussed.

This survey is not concerned with internal characteristics of the networks such as routing strategies and packet formats.

The eight networks surveyed are:

- Arpa Net, the Department of Defense's Advanced Research Projects Agency network in the U.S.
- Cigale/Cyclades, a French government-sponsored research network.
- CTNE, a network operated by the public carrier CTNE in Spain.
- DDX-1, an experimental network developed by NTT (the public carrier in Japan).
- EIN, the European Information Network, a joint research project among European countries.
- EPSS, the British Experimental Packet-Switched Service.
- NPL, the network at the British National Physical Laboratory.
- RCP, an experimental network operated by the public carrier in France.

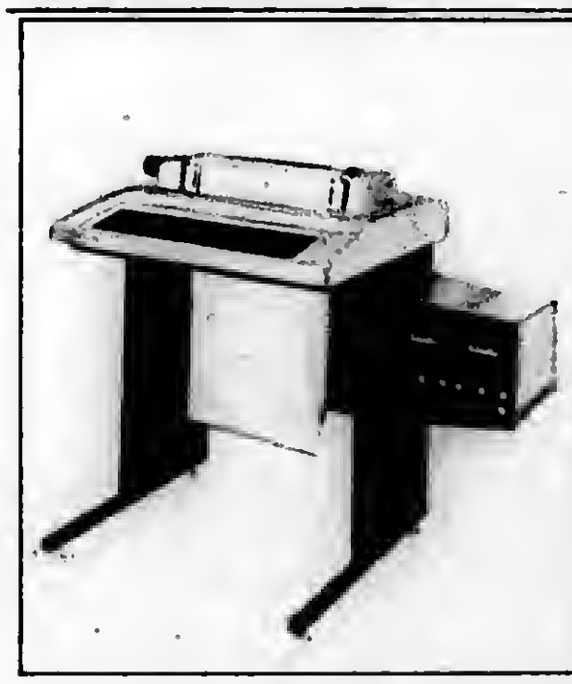
Packet-Switching Systems

The prime existing example of a packet-switched network is the Arpa network which comprises a data communication subsystem and a collection of host computers which together make up a resource-sharing network.

The packet-switched local network at NPL addresses the same fundamental communication issues, but on a small scale. Those two networks have been in existence for some years and have largely inspired the numerous other packet-switching networks in various stages of planning and implementation. However, these networks vary considerably in their design and the facilities they offer to the users.

The common feature of all the networks is the employment of well-formatted, relatively short message units called packets. The CCITT defines a packet as "a group of binary digits including data and call-control signals (e.g., address) which is switched as a composite whole. The data, call-control signals and possibly error-control information are arranged in a

(Continued on Page S/15)



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In Six Months

Communications Carriers Continue to Proliferate

(Continued from Page S/2)

Also users are finding many new ways to increase the usage of existing communications lines both by using these lines more hours per day and also by operating them at higher speeds. In many cases, users benefit noticeably by finding ways to schedule usage of such leased lines in certain periods of the day in certain areas of the country.

Scheduling perhaps might mean that a line's capacity would be used for data collection during one portion of the day switched over to on-line activity when the data collection function is not being performed.

Also coming into the picture for the first time is the awareness by users of the impact of digital voice on their network planning activities. Many customers investigating the viability of the new digital transmission services are concerned about losing the ability for alternate voice and data transmission on such lines.

Vendors have been preparing for this by developing digital voice-encoding equipment which will enable voice conversations to be carried on over these all-digital lines. Voice digitization is in its embryonic stages, but it does appear possible that substantial capabilities will exist for digitizing voice signals at speeds approximating 4,800 bit/sec (and possibility even slower at degraded quality).

Here an extremely interesting possibility opens up that would enable a corporation to perhaps multiplex individual voice conversations on a digital line which might also be used for data communications.

This problem is a sharp contrast to the concerns of a few years ago when the game was to maximize the number of bits per second which could be transmitted over an analog phone line of fixed bandwidth.

In the future, the game appears to be shifting to maximizing the number of voice conversations which can be sent over a given bit/sec in a data channel. Most users spend nearly 10 times as much on voice communications as on data transmission services.

It is interesting to note that the Bell System currently digitizes many of its voice channels in portions of its long-haul network using T-carrier signaling. Here one voice conversation consumes 56,000 bit/sec transmission capacity.

The monthly revenue derived from a voice channel which has been digitized will range from approximately $1/mile between high-density locations to something approximating $3/mile for circuits on a low-density basis. On the other hand, if the Bell System were to take this 56,000 bit/sec transmission capacity and utilize it to provide capability for Series 800 (wideband data) service to 50 kbit/sec customers, the average amount of revenue generated would approximate something like $10/mile per month.

Users should be very concerned about monitoring the DDS and digital pricing structures and understanding the full impacts which voice digitization equipment will have in the future planning of minimum cost communications networks and their corporations.

The alert planner must begin now to exploit the increasingly nebulous distinction between channels used for voice and data transmission.

Networking Equipment Trends

In the past year users have been very actively employing a variety of hardware devices such as split-stream modems, advanced multiplexing and concentration equipment and digital bridges for modem and port sharing.

Split-stream modems have certainly come into their own as cost-saving devices that enable one physical line to service multiple independent applications at a distance from the computer center.

The independent companies have recently introduced powerful split-stream modems with selectable splitting mixtures. This enables one mixture of speeds to be derived during part of the day and another mixture of speed combinations to be derived during other parts of the day. This type of hardware device enables the user to deploy a fixed amount of leased-line transmission capacity in a flexible way that gives him the greatest return on his communication line investment.

Another very popular networking idea is the inverse multiplexing technique (such as Biplexers from Codex Corp. and Lineplexers from International Communications Corp. (ICC) which has appeared. Customers are finding such devices to be very attractive ways for providing cost-effective service when they require point-to-point speeds faster than 9,600 bit/sec.

Another interesting possibility exists with Biplexers and Lineplexers. That is the idea of having two lines (one of them for backup) which will both be productive in a normal situation. When one line should fail, the system will continue to operate but at degraded speed.

In network optimization, there are many more design options available to the user today than ever existed before. The mainframe vendors are introducing unified networking architecture strategies (such as IBM's System Network Architecture).

Users continue to read and hear of the benefits of distributed intelligence in designing cost-effective networks. They continue to be plagued by an inability to quantitatively evaluate the true benefits of distributed intelligence in solving their networking problems.

The key is how much function will a distributed intelligence provide at what cost! The only viable way to finding these answers is for the user to become self-sufficient in design tools.

The user must develop his own set of design tools which he can use to evaluate his own set of application requirements in a completely objective way, free of any particular vendor influences.

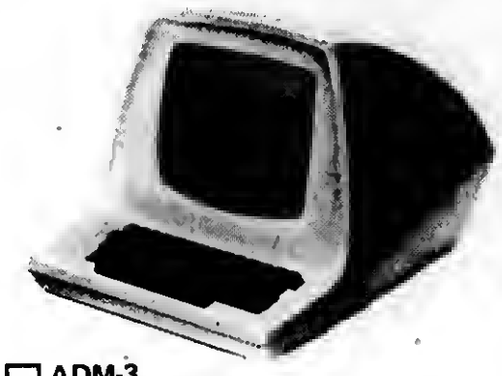
The familiar adage of "Let the common carrier design my network" has become a tired obsolete cliche which is heard with decreasing frequency these days.

Progressive users are setting up positive plans to acquire their own tools and

(Continued on Page S/14)

terminals

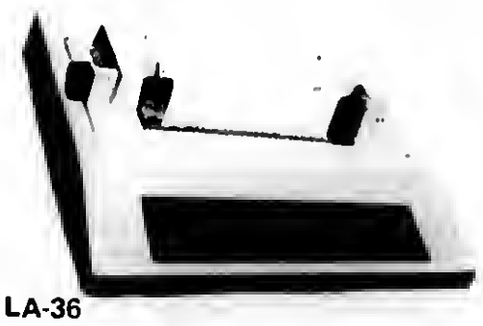
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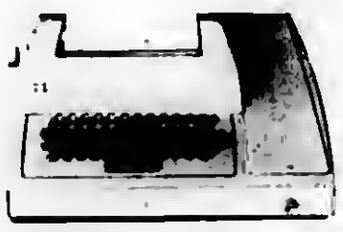
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Nets Make Reference Data Available in 50 Cities

By Mark Radwin
Special to Computerworld

Lockheed Information System's Dialog Information Retrieval Service provides access to a data bank of bibliographic and statistical information to users in North America and Europe, principally through value-added Tymshare, Inc.'s Tymnet and Telenet Communications Corp.'s data communications networks.

Dialog allows the user to interact on-line using the range of time-sharing hard copy or CRT terminals, directly with the Palo Alto, Calif., computer facility where over 7 million document references or statistical records are indexed.

The data bases, presently numbering over 30, cover major disciplines including areas in science and technology such as computers and control, chemistry, mathematics, physics, biology, agriculture and medicine; engineering disciplines; areas in the social sciences, business and finance.

There are several reasons why the utilization of value-added communication network services is essential to the offering of the Dialog service. The first is the wide domestic coverage. One network service which we have used for over 2-1/2 years, Tymnet, provides local dial access in over 50 U.S. cities. Almost all these cities generate too few connect-hours into the Dialog system to justify the costs of lines and multiplexers to serve them.

Another feature provided by the value-added networks, which is especially valuable to our operation, is virtual terminal support. This capability is provided by both Tymnet and Telenet in different ways, but Telenet's flexible approach in this area is particularly worthy of mention.

With virtual terminal support, the network provides very specifically tailored treatment of a variety of terminal characteristics such as transmission speed, character set (even allowing for minor differences between interchangeable type elements), carriage return and line-feed delays, full- and half-duplex operation, while allowing the host computer to handle these dissimilar terminals in a totally identical fashion, as if they all were Ascii-coded teletypewriters for example.

In addition to providing optimized treatment of each type of terminal equipment, Telenet allows the host computer to maximize the use of fewer total ports, using a single set of terminal support protocols with a minimum of host CPU and core overhead.

Telenet places control of around 20 terminal-related parameters in the hands of both the user and the host, with exclusive host control where desired, as well as default values internally established for a large number of terminals.

Users Have Choice

Dialog users have a choice of either paying a fee for using the value-added network service or directly calling Palo Alto telephone numbers. The user population is heavily weighted to the over-1,000-mile category so that direct distance dialing (DDD) costs tend to run close to the maximum $30/connect-hour.

Averaged total costs for providing Tymnet or Telenet communication network services with the Dialog application result in a communications cost which is a small fraction of dial-up phone rates, including all directly and indirectly related costs.

Both Tymshare and Telenet provide their customers detailed data on each user connection. This data, particularly when provided on magnetic tape, has proved extremely valuable in managing the network resources. Besides providing a convenient means of tracking factors such as port utilization, regional and city growth statistics, it also provides information which is useful in comparing tariff options where offered and for evaluating the economics of an in-house network on a city-by-city basis.

A further benefit provided by the value-added network is the end-to-end error-free data delivery (except for the user's local loop, of course), and complete maintenance responsibility. When maintenance is required, it is performed rapidly.

The Telenet network commenced commercial service in mid-August and the Dialog system became operational on it in mid-September.

The Dialog system runs on an IBM 360/65 with an IBM 3704 front-end processor. The 3704 is linked to Telenet by means of a synchronous access line and contains a Telenet-furnished program, the Telenet Modified Emulator Program (TMEP), for controlling the interface.

The Dialog system was the second installation of the 3704/3705 Telenet Emulation program extension.

TMEP is a solution to a major problem the Arpa net faced in providing a totally transparent host-network interface. It allows the host software to continue supporting terminals in precisely the same way as it did before and performs the required software interfacing and line control for network access in the front-end.

This software system did require some debugging at our site, but this proceeded rapidly with Telenet's technical support. In the following two months of operation, the front-end has run without a single problem or crash.

Estimating the average number of packets per connect-hour used by Telenet proved to be both simple and accurate. The average number of user commands per hour was known along with the resulting breakdown as to short (single-packet) and long (multiple-packet) outputs. The highly output-intensive Dialog application results in good packet utilization, and thus an economic means of delivering large volumes of characters to our users.

We have, at this writing, conducted in-house testing of Telenet and completed an initial user test in which several users in each Telenet city were requested to make their own evaluations.

Their reactions have been uniformly positive. They helped point out some of the weak areas of the preliminary user instructions we had prepared, and a couple of them ran into the typical start-up problems of not setting the duplex switch correctly or not finding an appropriate terminal identifier.

These problems are typically identified and resolved with just a few minutes discussion and most could have been obviated with more comprehensive user instructions. Generally speaking, once users learn the very simple connect procedure they become fully self-sufficient.

Radwin is on the staff of Lockheed Information Systems in Palo Alto, Calif.

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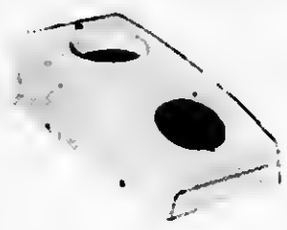


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Doubt Still Present Regarding Bell's Claims for DDS

(Continued from Page S/2)

no one knows. As for Ma Bell, she's not telling. No one at Bell has even publicly admitted the possibility of using anything but DUV for DDS.

The price of DDS service is not the only thing that is unsettled. Claims of better performance are also a long way from being substantiated.

From a communications standpoint, performance can be viewed in three ways: error rate, response time and maintenance. Although Bell is making great claims for DDS in these three areas, it is remarkable how weak the claims appear after examining each in detail.

First, it is important to remember that, to the customer, DDS Service will appear fundamentally the same as analog service. Bell provides the customer with an EIA-compatible terminal interface through which data is accepted and/or delivered. A point not often mentioned by Bell, however, is that analog extension service will often be required to bring the joys of DDS to the user (see Figure 1).

For several reasons, which will be discussed below, Bell would prefer to ignore the fact that voice-band modems will always be present in the DDS network. Instead, Bell gives the impression that nearly everyone will be just a few miles from a DDS hub site.

In fact, nothing could be more misleading. A quick glance at the map of proposed DDS cities shows vast areas of the U.S. will not be served by the digital data highways and will require analog extensions (modems).

At present, only 13 cities are included in the DDS network, a far cry from the originally proposed 96 cities by 1976. To make matters worse, the digital intracity routes in major urban areas are not yet installed.

It appears the switch-over to the digital world will not be as painless or as complete as Ma Bell would have us believe.

In all references to error performance objectives, Bell tacitly assumes all-digital transmission. But what are the effects of analog extensions? Performance of the whole link can obvlously be no better than that of the analog segment.

Simply comparing Bell's statistics for all-digital DDS vs. analog services produces interesting results. Bell quotes DDS error performance objectives in error-free seconds (EFS). At data rates of 2.4-, 4.8- and 9.6 kbit/sec the 99.5% EFS figure quoted by Bell translates to bit error rates in the vicinity of or worse than 1 in 10^6 It is interesting to note that many modems can offer performance as good as 1 error in 10^6 bits and that the exact relationship between EFS and bit error rate depends on the amount of clumping of bit errors on the facility.

Bell normally claims bit error rates better than 1 in 10^5 over analog facilities using Bell system modems. Thus, at most, the difference in error rate is less than a factor of 10, between 1 and 10^6 and 1 error in 10^5. In many cases the error rates may be the same or even better on analog facilities.

Of course, the case of DDS with Bell analog extensions has yet to be tested for error performance. Expectations are that this hybrid service would offer error rates consistently worse than all-digital DDS.

Even supposing the difference of a factor of 10 in error rate exists, is this a significant difference? Considering the fact that nearly all data communication uses some type of ARQ protocol for error control, the question really is: Does transmission throughout efficiency go up greatly if bit error rate is lowered from 10^5 to 10^6?

For block lengths up to several thousand bits and for one-way propagation delay up to 100 msec the answer to the question is "No, not really."

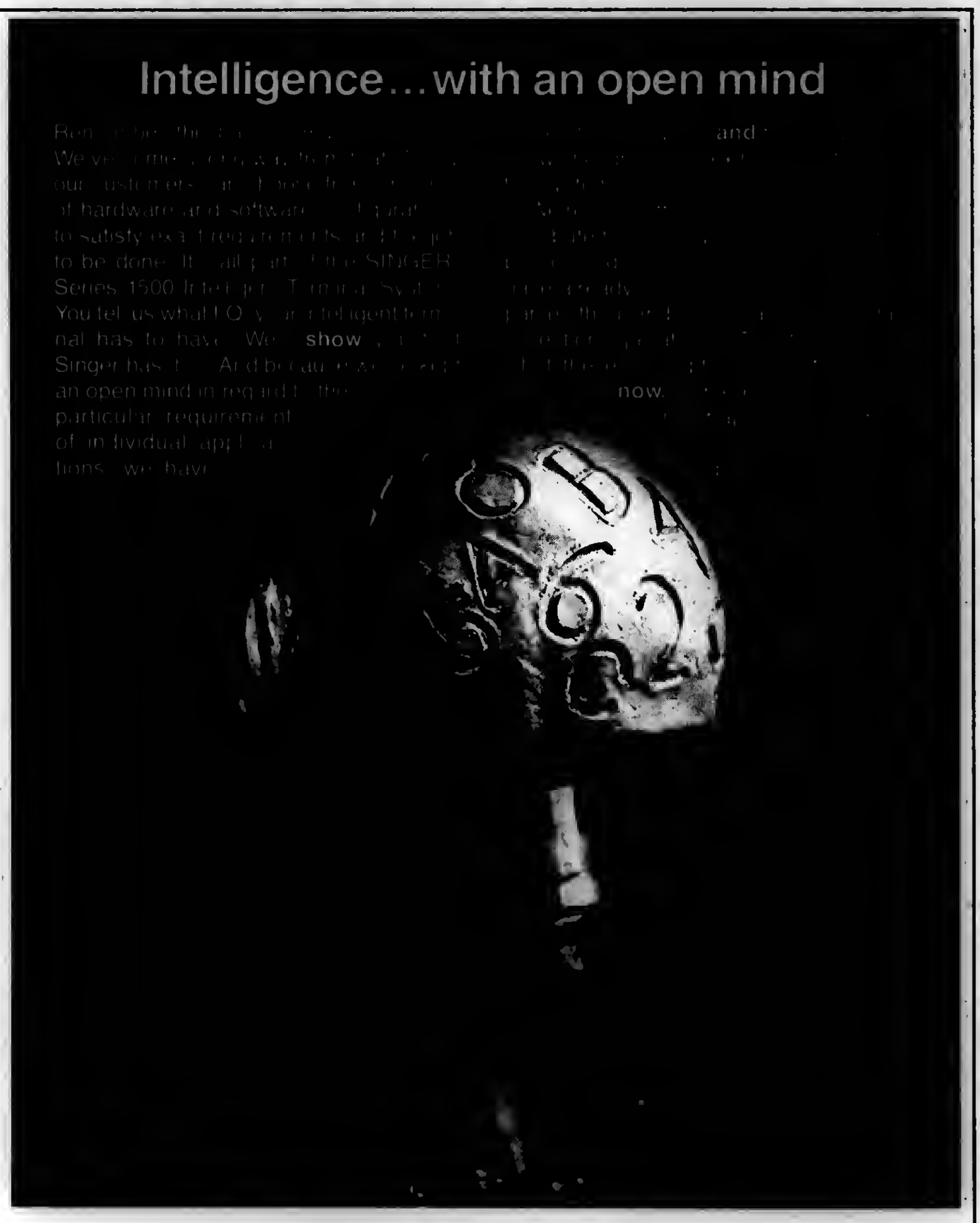
For example, operating at 4.8 kbit/sec over a long link with 70 msec delay with 1-kbit blocks, the difference in throughput efficiency at 10^6 and 10^5 is less than 1%.

Plans to Offer Multipoint

Although multipoint service is presently not available, Bell plans to offer DDS multipoint some day. In a multipoint environment, response time is critical to performance.

The response time of a communications link figures heavily in determining the

(Continued on Page S/10)



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Intelligent Terminals Fast-Growing Area

(Continued from Page S/3)

erators. This permits all data-entry activities to have access to current information and, when appropriate, to treat disk data as a commonly accessed "electronic tub file."

To overcome these disadvantages of the single intelligent terminal, some vendors have incorpoated the concepts of intelligent terminals in clustered versions. In systems such as these, each display can perform as an independent intelligent terminal with respect to user-programmed data entry. Multitasking software allows data entry to run concurrent with processing and communications.

Where this is well designed, there is a compatibility of programming, communications and operations that makes the intelligent terminal complement the clustered system.

Using such a family, an organization may tailor the elements of its distributed processing network to fit the throughput requirements of each site.

Thus, on the one hand, we have the distinct advantage of a powerful intelligent terminal processing system – extremely useful at a site when limited data entry and remote processing is required.

On the other hand, there are the disadvantages for sites which require greater data-entry capacity of higher cost per display, lack of shared files and duplicated peripheral devices. These requirements are met in clustered versions of intelligent systems.

To tie the two together and allow the user a single-source vendor, a well-designed system must have compatibility of programming, communications and operations between single-terminal systems and clustered systems.

This gives the user the flexibility to configure distributed processing networks with small as well as large sites, it minimizes training difficulties and provides a clear and simple growth path for each remote site.

Seigle is director of marketing support at Sycor, Inc.

CRT Devices Link Architects With Data at Branch Offices

By Brent D. Barkley
Special to Computerworld

Display terminals are helping Reynolds, Smith & Hills Corp., an architectural engineering firm in Jacksonville, Fla., provide essential technical information and processing capability input from remote engineering branch offices.

The company provides a range of services from branch offices located throughout Florida and the Southeast.

Typical engineering projects are environmental studies where mathematical modeling is done of air and water quality. Flood plane delineation, oceanographic and coastal process data is evaluated, and conventional engineering evaluation and architectural evaluation is researched.

Structural analysis, water network design, sanitary sewer design and, in the architectural areas, project scheduling, Pert and CPM applications are also done.

For this complex task, Reynolds, Smith & Hills looked for many months for a data terminal which would satisfy its needs for being able to provide interactive communications from remote sites to its system.

The computer system is a Univac Series 70 Model 46, having a Virtual Memory Operating System (VMOS) and incorporating multiprogramming capability.

Accessory equipment on the system includes a 1,200 line/min printer, eight disk drives for a total of 200M bytes of storage, three magnetic tape drives and up to 16 remote terminals. In addition, there is off-line equipment consisting of graphics equipment for rapid transfer of data from maps or drawings to the computer.

Features of 40+

The 40+ data display system from International Communications Corp. (ICC) was selected by the firm for its remote terminal requirements because it had all the features required to handle fast, complex input of data, programming and hard-copy output at the remote site.

Rodney D. Ghioto, engineer and environmental systems analyst for Reynolds' Orlando office, played the key role in selecting the 40+ for its application.

He felt the 40+ with a line printer running at 1,200 bit/sec provided the needed capabilities for the remote engineering offices and provided the data link to the CPU in Jacksonville.

The 40+ terminal system is located in the engineering office in Orlando, Fla. Initially, the system was installed at 300 bit/sec full-duplex.

Analysis Made

It was found that 30 char./sec was slow for the firm's needs, and an analysis of the costs was made.

It was determined that, by field upgrading the terminal to 1,200 bit/sec half-duplex dial-up utilizing a foreign exchange line (Wats) at a fixed rate per month, Ghioto could save a significant amount of money, up to half of what the initial costs were, for a regular direct-dial facility from Orlando to Jacksonville.

It was a simple matter to upgrade the 40+ from 300 bit/sec to 1,200 bit/sec through internal switch options, and it was running at 1,200 bit/sec on-line within a day.

Considered Other Terminals

During the evaluation and selection phase, Ghioto had looked at several other terminals such as Hazeltine and Bell's Dataspeed 40. In the evaluation it was found Hazeltine and Dataspecd 40 could not meet all of the performance requirements.

Other terminal vendors had a difficult time meeting the service and delivery requirements which were rather stringent at the time.

The company made the decision to select ICC's 40+ following a performance evaluation period on site.

The 40+ provides a remote input to the Univac system and enables the systems analysts, engineers and programmers to go on-line and provides them with the applications needed.

Two Primary Groups

Two primary groups are included in these applications: conventional engineering systems and environmental systems.

There are programs within the Univac applications software to calculate regional water supply and waste water disposable optimization, water network analysis, sanitary sewer design and solid-waste collection.

The environmental systems include programs for hydrologic water quality, thermal dispersion and ground water modeling. In addition, numerous other programs are available and can be executed through the 40+ terminal.



Rodney D. Ghioto is shown at the keyboard of the ICC 40+ terminal.

Ghioto feels it essential he have access to a terminal system for on-line data input and he feels "he can't work without access to a terminal because of the R&D naturc of his work.

Typical Problem

A typical problem was one in which Ghioto had to have a complete hydrology model for 250 miles of flood canal with greater than 1,000 subwater basins.

For a while many of the engineers and

(Continued on Page S/18)

MOVE OVER 1403. THE 2550 IS HERE.

Make room for the Dataproducts 2550 horizontal-font printer.

Until recently, the IBM 1403 train printer has been the industry standard for quality printing at 1100 lines per minute (LPM).

But now the 2550, with the Charaband® print drive,sets a new standard at 1500 LPM.

Or, 36% faster than the 1403.

Horizontal Font Printing

The Charaband is a horizontal-font carrier that offers all the advantages of train printers, and eliminates the disadvantages of sliding friction.

The 2550, combining the Charaband with our patented Mark IV hammer, offers a highly reliable friction-free print mechanism.



In short, consistent, straight-line, high quality printing.

Reliability Plus

The Charaband is driven on a roller bearing system to eliminate sliding friction and lubrication systems.

And, unlike train printers, very little wear occurs in the print mechanism.

Reliable operation— equals much less down time.

On-the-job Flexibility

The Charaband carries two complete fonts—one on each side.

The fonts are reversible.

The 2550 also offers replaceable character-type modules that don't require a cartridge readjustment.



A 90° swing-open gate for easy access to Charaband, ribbon and paper.

And simplified controls built into your own "quietized" cabinet.

The 2550 Costs Less

It costs less than the 1403.

Yet, its exclusive Charaband design is a clear-cut improvement in line printer technology.

How do we do it?

Simply by specializing.

Dataproducts is the leading independent printer manufacturer in the world.

And by concentrating in one technology, we are able to make a better printer.

For less than the competition.

Our 2550 Charaband printer is 1500-LPM proof of that claim.

Interface Compatible

The 2550 can be interfaced with almost every major computer system that requires high-speed performance.

So we invite you to call or write for full information and specs.

Remember, Charaband horizontal-font, 1500-LPM speed, less down time and less money.

Little wonder the former industry standard has to move over.



Dataproducts
The Line Printer Company

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Reasonable Doubt Exists as to Bell's Claims for DDS

(Continued from Page S/8)

overall response time of a polled, multipoint network. Link response time is defined as the sum of the round-trip propagation time of a link (including modem or DDS line driver delay) plus the setup time (time between a Request-to-Send signal and a Clear-to-Send signal) of a modem or DDS line driver.

In polled systems where messages are short and often infrequent, the network response time is primarily determined by link response time. As messages become longer and more frequent, the link response time takes on less importance in determining operating characteristics.

The response times for DDS links are very different from those of analog facilities. Because DDS is bit-oriented, DDS link response times are longer at lower data rates and shorter at higher rates.

In contrast, data transmission over analog links produces link responses that are shortest at the lower data rates such as 2,400 bit/sec.

This fact is borne out by statistics supplied by the Bell system (Technical References PUB41022, PUB41005). The results show that, at 2,400 bit/sec, analog facilities provide approximately a 2:1 advantage in response time over DDS. The advantage is true for short-, medium- and long-haul connections.

At 4,800 bit/sec, DDS and analog facilities are roughly comparable for long-haul and medium-haul circuits. For short-haul circuits, DDS 4,800- and 9,600 bit/sec facilities are predicted to have shorter link response time.

Of course, the statistics for DDS multipoint service are still only theoretical. It remains to be seen what the actual performance of the DDS network will be when it finally is put together. The question of analog extensions in a multipoint environment has not been discussed by Bell.

In configurations where multipoint analog service is tied to DDS, the link response times of DDS will necessarily increase moderately at 2.4 kbit/sec, more strongly at 4.8 kbit/sec and disastrously at 9.4 kbit/sec. In fact, in this mode of operation, analog facilities will have response time advantages at all three data rates.

One of the biggest single pitfalls of DDS lies in the area where most prospective users expect it least: system maintenance.

Although Bell touts incredibly high availability goals for DDS, there is no good reason to believe Bell can meet them. Indeed many users of Bell modems and analog facilities have often found the phone company excruciatingly slow in responding to communications problems in the field.

To combat this problem, a whole industry has sprung up that specializes in diagnostic gear for users who want to control, monitor and help to maintain their own data communications networks.

But by far the most distressing aspect of DDS is the user must relinquish his right and ability to monitor and control his own networks. The user will be "blind" to the workings of his links, except to observe message errors at the computer or the terminal. Users will have no way of pinpointing problems or speeding the repair process.

After a problem is found, users will have a tough time establishing a backup connection to handle data traffic while the digital link is being repaired. Dial backup for digital links will be tricky and expensive, because DDS terminal equipment does not produce signals suitable for transmission over the direct distance dial (DDD) network.

The user can, of course, purchase VF modems that do nothing but provide dial backup, but that seems rather impractical. With no recourse to a backup system, the user must simply wait for the phone company to repair the digital link.

It is interesting to note, however, modems used on private-line facilities are generally capable of operating over DDD circuits as well. With dial backup for analog links, the user can be up and running in seconds after a private line fails.

The little extras many users of analog links take for granted will not be available with DDS.

Independent secondary and reverse channels for sending low-speed data along with high-speed data will not be available. On DDS-type facilities the lowest speed service available is 2,400 bit/sec. Using DDS, it is impossible to send both full-rate (2.4-, 4.8-, 9.6 kbit/sec) data streams and low-speed (110-, 150-, 300 bit/sec) secondary channel data together at no extra charge. With ordinary private voice-grade lines, there is no additional line charge incurred when secondary channels are frequency-division multiplexed with high-speed data.

Alternate voice communication on the same lines used for data will also not be available with DDS. Any voice coordination with remote site personnel must be made via separately routed telephone facilities at extra cost.

Lyon is manager of research for Intertel in Burlington, Mass.

In Past Five Years

Communications Increasingly Used to Link Systems

By David J. Farber
Special to Computerworld

Over the past five years, there has been a rapid evolution of the use of communications facilities to interconnect data processing systems.

Initially the computers involved were limited to large-scale scientific and business systems.

As the usefulness of these interconnected processors became more and more a part of the way organizations used computers, it became clear the large-scale computers were not adequate and they were too expensive to perform certain tasks that were necessary in such computer networks.

A major task that must be performed in any data transmission-oriented application is to control the communications lines and the transmission of information between the main processing unlts that constitute the distributed system.

The control of data and recovery from errors is a major task and is one that places a heavy real-time demand on the main processors (hosts). Over the past several years, this function has been migrating from the main processors to front-end miniprocessor-based units.

Two examples of this are found in contemporary systems. In the Arpa net the front-end processors – the Interface Message Processors (IMP) – are completely responsible for the delivery and routing of the data as well as the correctness of the transmission.

Another example is found in many corporate data networks where the use of mini processors as telecommunications controllers allow companies to use long-distance expensive communication lines in an optimal fashion.

In one particular application in the construction industry, allowing the front-end minis to compress character data and to do forward error control paid for the cost of the minis in the first six months of operation of the data line.

Terminal Controllers

As the number of host machines that are available for cooperative or distributed processing increases, the problem of how to allow users to access the various services that exist on such networks becomes major.

Here again mini and micro processors have found a place as terminal controllers. In the case of the Arpa net there are two types of such terminal controllers. The first of these is a combined front-end communications controller and a terminal controller.

Its function is to allow terminal and remote batch configurations to economically access the network and thus the attached service machines. These combined-function minis are called Terminal IMPs (TIPs).

The second type of terminal front-end is the miniprocessor which acts in two roles in the network. One is as a small multiuser computer system which allows users on terminals to create data and text files and to examine the results of runs that have been made on the network service machines.

In addition they can act as front-end terminal machines to allow terminal access to the network's large-scale resources.

A number of such systems exist on the Arpa net. They are called ELFs, ANTs or UNIXs and are currently all on Digital Equipment Corp. PDP/11 minis. They remove these time-consuming activities from the large computational servers of the network and thus allow both faster interactions for the users as well as much cheaper access to the network.

Other Uses

Existing networks of computers have concentrated on the interconnection of large systems that are geographically separated by large distances. There are other uses for the networking capabilities that involve the interconnection of computers that vary in size, but are locally distributed within buildings or shopping centers, etc.

The purpose of such interconnections are to allow for the distribution of local processing for reliability reasons as well as for economic reasons.

Examples are found for this type of networking in the process control area, in the command and control domain as well as in the commercial banking sector.

In addition, such local networks tend to be used to distribute the information that may be coming in from national and international networks to terminals and/or computers that exist on the local sites. There are a number of examples of such

(Continued on Page S/18)

The Private Eye.
It solves the mystery of data communications networks.

The new Codex 6000 Series Intelligent Network Processor.

The Codex 6000 combines the most attractive features of time division multiplexers and computer-based concentrators in a unique microprocessor-based system architecture optimized for data communications.

The 6000 slips into a network without a clue it's there. It's completely transparent to network protocol, terminal mix, system configuration or existing control facilities – yet requires no customized programming.

Investigate how the Codex 6000 cuts line costs by combining statistical bandwidth allocation and data compression – outperforming traditional TDM's by factors as high as four to one, with less node-to-node delay. You can trust the results – data is assured error-free by a full-duplex internal ARQ protocol.

The 6000 checks out all the facts. From a central-site communications and control console, the 6000 surveys your network, collecting statistical data on terminal error rates, trunk performance, node performance, data compression efficiency, line utilization, etc. Then computes it and reports it. Assign it pre-set performance thresholds, and it notifies you when they're exceeded. Use it to identify bottlenecks, to arrest inefficient use of resources, to initiate diagnostics, and to reconfigure system characteristics.

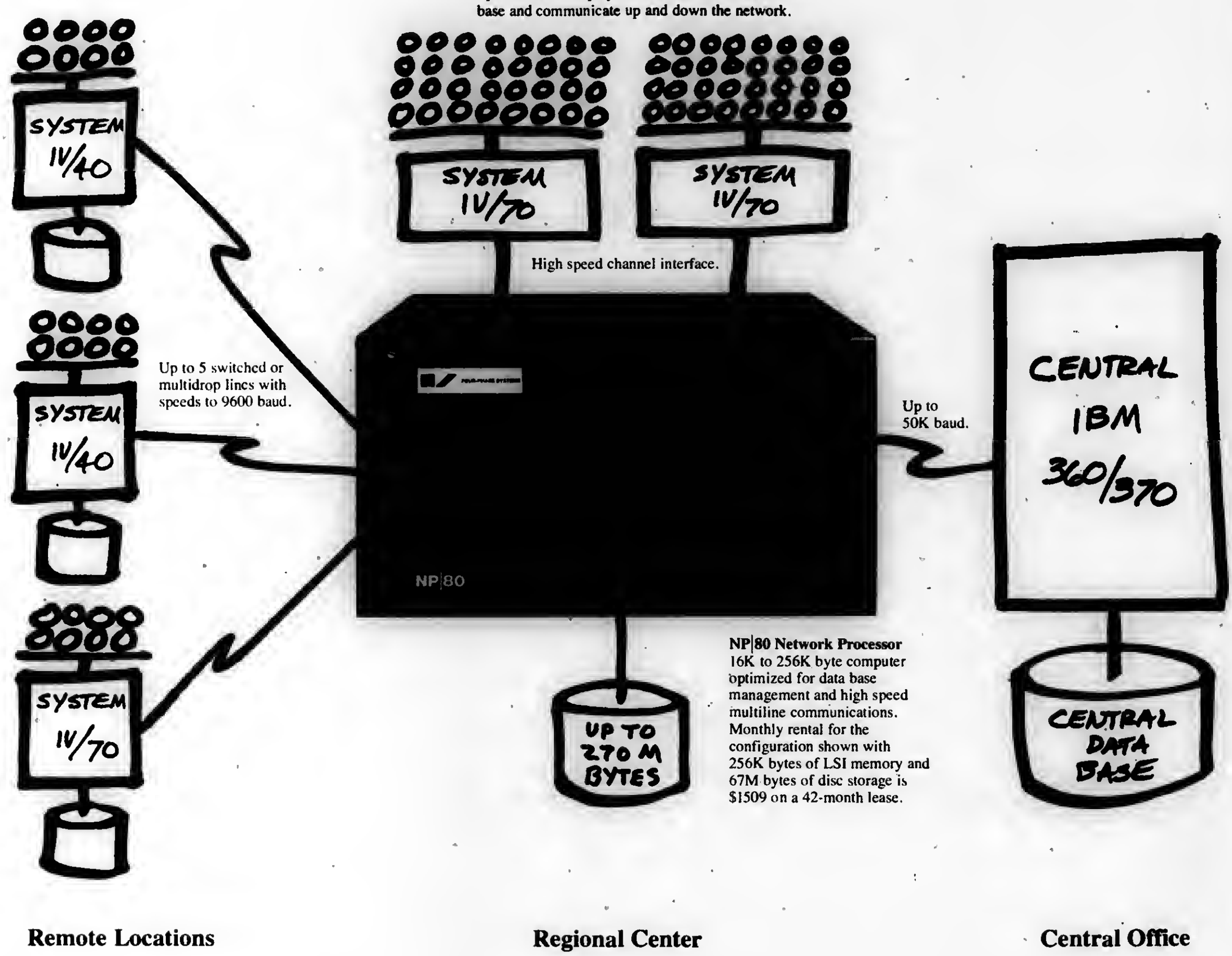
The Private Eye from Codex, sweetheart. Provides you with a great case for better network planning, management and growth. Another innovative product for the communications networks of tomorrow, from Codex, today's technology leader.

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NP|80: The new Network Processor that distributes your data the way your company is organized.



NP|80 Network Processor
16K to 256K byte computer optimized for data base management and high speed multiline communications. Monthly rental for the configuration shown with 256K bytes of LSI memory and 67M bytes of disc storage is $1509 on a 42-month lease.

Remote Locations **Regional Center** **Central Office**

Hierarchical networks for hierarchical organizations.

Makes sense doesn't it. Ideally, information should flow up and down a network as it does in an organization . . . with geographically distributed files at branch, district, and regional locations in keeping with departmental scope and span of control.



But until now, a simple solution for these intermediate sites has not been readily available.

What's needed is a new kind of processor that can complement today's remote systems by filling the gap between the lowest level in the network and the central office. What's needed is a unique computer for large regional and district sites . . . optimized for distributed data base management and wideband multiline communications.

What's needed is the NP|80—the new Network Processor that distributes your data the way your company is organized.

NP|80—the missing link.

Four-Phase Systems' NP|80 is a new computer system that complements and extends the capabilities of our popular System IV/40 and System IV/70, field proven with over 70 million operator hours.

Designed for use at intermediate network locations, the NP|80 lets you distribute computing power and data files naturally throughout your organization while preserving compatibility with both current line disciplines and IBM SDLC protocol.

Up to 64 local displays can access an NP|80 data base of up to 270 million bytes through direct channel connection of two System IV/70's.

These same displays can also access your central data base at speeds up to 50K baud through the NP|80's wideband communications facilities.

While performing data base management and communications services for the local System IV/70's, the NP|80 can concurrently provide master multipoint control for an extensive network of remote Four-Phase systems with speeds up to 9600 baud.

Now each level of an organization can store frequently used data in local system files for interactive access. At the same time, operators can retrieve information stored at higher and lower levels throughout the organization.

As a result, system response patterns can be matched to local requirements through flexible application of total network resources.

Multilevel network access.

Multilevel distributed processing adds a new dimension to remote computing.

Displays at remote locations can access local, regional, and central files with automatic routing based on data availability. Typically, most transactions will be processed against local files while exception transmissions are passed to the next highest level.

Similarly at regional sites, transaction processing can be supported by both local and central files while down line communication is pipelined through the NP|80 with negligible CPU loading.

Central control with local autonomy.

Now line managers can assume responsibility for the data processing they require. Needed reports and documents are easily generated at remote locations using COBOL, RPG, Sort, Assembler, DOS, and an extensive selection of utilities. And programming can be done either locally or at headquarters.

For data base synchronization, branch and regional files can be updated from the central site. Detailed information in these files can also be accessed by headquarters when required.

Complete freedom exists to tailor networks exactly to your needs. Regional NP|80's can communicate with district NP|80's which in turn can communicate with branch System IV/40's and System IV/70's.

Through such multilevel processing, the NP|80 offers large network users enhanced system performance, increased functional capability, expanded display support, reduced mainframe loading, hierarchical fallback, and greater flexibility in meeting changing or expanding requirements.

Distributed data management.

NP|80 network control and data management services are provided by a resident multiprogramming executive. While transparent to system users, the NP|80 can concurrently support shared file access and high speed communications for separate application programs on two System IV/70's.

The NP|80 performs indexing, searching, and deblocking operations for the attached System IV/70's while handling communications concentration for the lower level systems. Blocks of up to 128 sectors may be read or written by the NP|80 with a disc transfer rate of 1.2M bytes/second.

The parts we needed didn't exist, so we had to make them ourselves.



Magnified view of Four-Phase's new 16K-bit n-channel silicon gate RAM.

In 1970 we introduced the industry's first computer with LSI semiconductor memory and an LSI central processing unit.

In 1972 we shipped the industry's first systems with 2K LSI RAM's.

Now with the NP|80, we've created another milestone—*the first computer to be introduced with 16K LSI RAM's.*

We design and manufacture not only the displays and computers employed in our systems, but also the LSI components used in them. Not because making semiconductors is our business. But because producing the most advanced distributed processing systems is.

256K bytes of network processing power.



This hand contains all the 16K-bit RAM chips needed for the NP|80's 256K byte memory with error correction.

The heart of the NP|80 is a powerful 16-bit computer with 500 ns cycle time and up to 256K bytes of LSI memory.

The system includes multiple DMA channels, software and hardware error recovery facilities, firmware diagnostics, a memory relocation and protection system, and communications control for up to six high speed lines.

To learn more about the NP|80 and our comprehensive selection of distributed processing software, send for our new brochure.

Four-Phase Systems

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Please send me the new NP 80 brochure.

Mainframe _____ No. and type of terminals _____

Name _____ Title _____

Company _____

Address _____

Telephone _____

City _____ State _____ Zip _____

Optional Data Communications Carriers Proliferating

(Continued from Page S/6)

establish in-house networking expertise to allow them to cope with and constructively evaluate the myriad of service possibilities in their own shops.

International network optimization is also receiving significant attention these days. The amount of traffic to overseas locations is on the rise in most every user organization that has any business activities outside the continental U.S. Leased-line charges between countries tend to be noticeably higher than for comparable distances in the U.S.

This means the payoffs for a well-designed, cost-effective network are that much bigger on the international scene.

Part of the difficulty faced by most users is a relative scarcity of people and organizations which understand the alternatives and choices available for voice, record and data transmission services to locations outside the U.S.

Increasing Net Productivity

However, careful awareness and study of the alternatives may open up new possibilities for increasing network productivity and cost-effectiveness.

If multipoint data communication lines are not fully loaded, it might be possible to put more terminals per line and reduce the number of lines. This would reduce line costs and perhaps port charges and modem charges at the central site.

AT&T Telpak extension pricing is scheduled for elimination during the month of November. In the past it has been possible for users to price all mileage for lines outside of Telpak according to the old voice-grade line tariff, if at least part of the circuit was routed through Telpak.

Many users took advantage of this tariff provision to pass channels through very short Telpak sections and then have very long mileage runs to Lo Density locations priced using Telpak extension tariffs.

The impact of this loophole elimination means users of Telpak extension tariffs will be forced to pay more for such channels. It appears as though AT&T will force users to price these extensions according to the Hi Lo tariff as well.

Since such Telpak extension circuits will now be priced according to Hi/Lo, it may be possible for users to run such channels directly back to their concentrators or computer centers and not pass through Telpak at all.

Savings possibilities exist from evaluating the benefits of such rerouting of data circuits currently assigned to Telpak.

Location in the same state as the DP center can be connected to the central site using either intrastate or interstate tariffs. The user must evaluate both possibilities and use the one which is collectively lowest cost.

Intrastate pricing will govern situations where these locations in the same state are connected using circuits which have no drops outside the state. If one or more drops outside the state shares a circuit with these locations within the state, then the entire tariff will be priced according to Hi/Lo.

Cost-saving possibilities exist in situations where there are a substantial number of locations in the same state with the DP center.

With the eminent availability of 56 kbit/sec DDS at substantially reduced prices from a current Series 8000 wideband offering, it may become possible for users to justify multiplexing and concentration of synchronous lines at substantial distances from their central points.

In the past it has generally been true that Series 8000 wideband data offerings did not offer much of an economy over individual channels priced according to Hi/Lo. This will change with the institution of 56 kbit/sec DDS pricing at noticeably lower rates than previously available with Series 8000.

Users should investigate the possibility of scheduling the use of their lines for different applications at different times of the day. Many on-line networks do not need to use lines except during normal business hours.

In many cases then it will be possible for a customer to use a certain amount of leased-line capacity for the on-line application during normal business hours and flip the line usage over to the other less critical applications in the evening hours. This will eliminate the need for multiple leased lines to accommodate the two or more different kinds of applications.

Users operating multipoint networks of more than a few dozen terminals should continually evaluate whether or not the assignments or terminals to circuits produces a collectivcly minimal cost network.

Many leased-line networks grow with a series of individual terminal additions to an existing network. Sometimes users fail to collectively design the entire network for minimum cost in such situatlons. A simple regrouping of terminals to circuits can produce almost 10% to 15% cost reduction at no degradation in performance.

Some users ignore the possibilities of realizing cost savings as a result of auditing their telephoning and common carrier bills regularly. Common carrier invoices can contain appreciable billing errors.

When one user called an error to the attention of the common carrier, he was given a retroactive credit that amounted to a savings of more than $3,000 in a particular situation. Users should take the time to make certain they are being invoiced only for specific carrier facilities they are using. And they should also be concerned with making sure that the billing invoices for such services are correct.

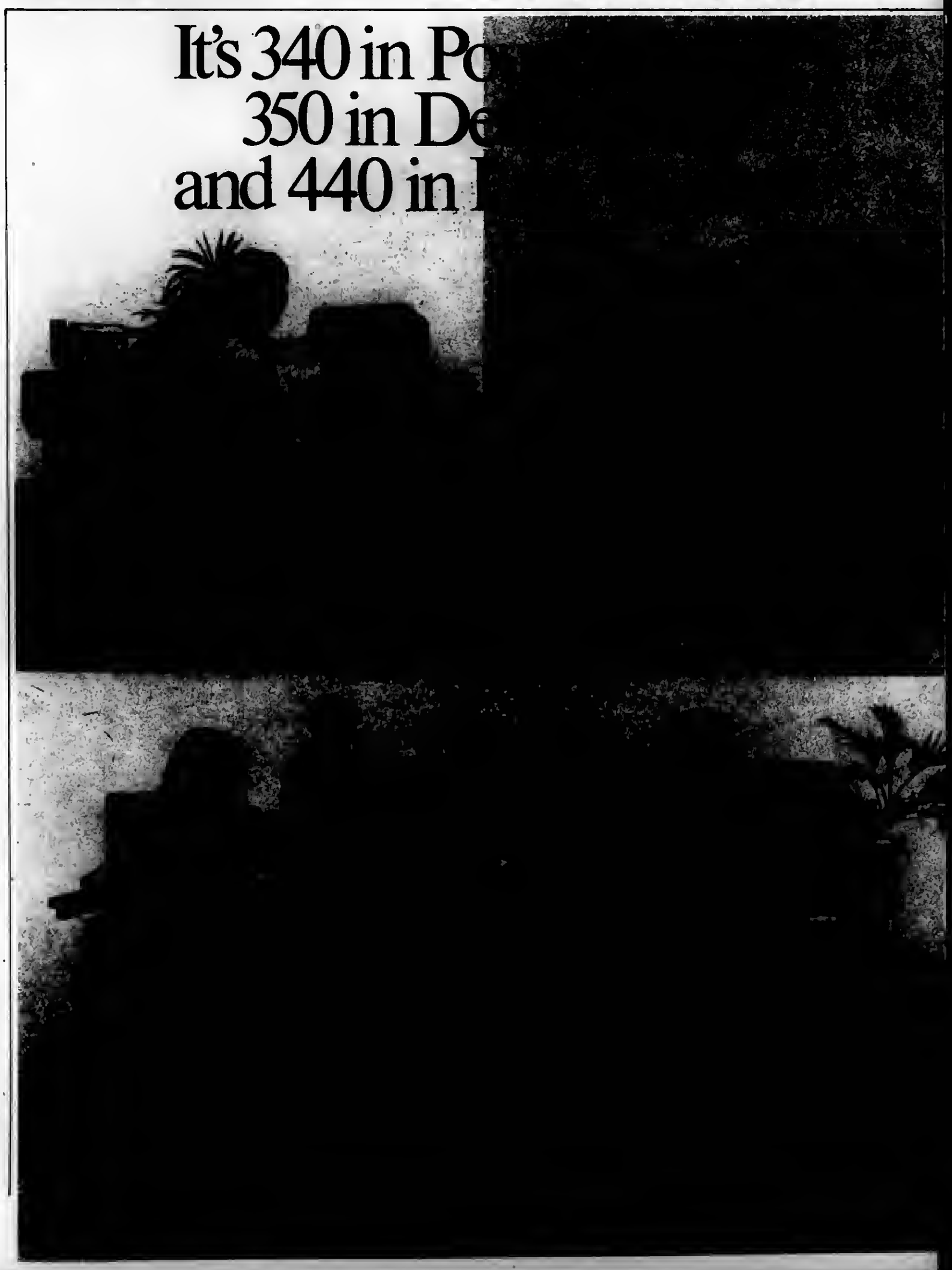
There is a popular belief among the data transmission community that satellite channels with their long propagation delays may not prove cost-effectlve for Binary Synchronous Communiations (BSC) applications of batch data transfer or polling.

While it is true that the effects of a propagation delay does directly affect performance in BSC channels, it is by no means certain that this effect will always be unacceptable.

In many cases the production of very substantial cost savings may more than justify slight degradations of performance. This may hold true either in batch data transfer application or in polling environments.

Users should periodically evaluate their collective requirements for bandwidth in each of their remote locations in their network. It may turn out that the use of the previously mentioned dual-stream

(Continued on Page S/23)



In Comparing Capabilities

Study of Eight Nets Should Prove Useful to Users

(Continued from Page S/3)

specified format."

Essentially, each addressed packet occupies a transmission channel for the duration of the transmission of the packet only. The channel is then available for use by packets being transferred between other users. Thus, channels between packet switches are shared among many users on a demand basis, and it becomes possible for a customer having a single link to his packet switch to engage in the exchange of data packets with a number of other users at the same time.

To a user, a packet-switching service can be regarded basically as the acceptance and delivery of well-formatted packets. For the computer attached to the system (the host computer) a simple protocol is also required for the immediate link with the network to deal with local flow and error control and with those control signals which are outside the stream of data packets.

A packet-switched system with these simple functions has been called a "primitive packet-switch" or "datagram." Such systems represent one end of the spectrum of packet-switched systems.

In the simple system described above, a packet is launched into the network without knowing the state of the receiving device and a stream of packets might be sent which cannot be delivered.

Although packets are unlikely to be delivered garbled, they may possibly be lost or duplicated in transit. The packet sequence can also be changed, on occasions, because of the variable delay due to routing and to retransmission following an error.

Protocols which deal effectively with all these deficiencies can be left up to the host computers or incorporated into the packet-switching communications network.

In the latter case, the network can be used to provide the logical equivalent of a circuit between computer and computer or computer and terminal. This has been called a "virtual circuit." A protocol is required to set up the virtual circuit between what is effectively a port on the computer and another port or terminal.

In addition, a procedure is required for using the virtual circuit once it has been established.

Several important characteristics of a packet-switching network influence the requirements imposed on the user considering connecting his computer or terminal to the network. The characteristics are defined here and used subsequently in the survey.

Any membership qualification for joining the network must be satisfied. Existing and planned networks can be categorized into two classes: private and public.

Private networks are restricted to a closed community such as an organization or a research community with common interests. Public networks are operated by a public carrier as a service.

Private networks which are developed for research and experimentation purposes may not be cost-effective in providing services, but public networks will need to offer cost-effective services to survive.

The type of packet service provided may be of the simple datagram type or a virtual circuit, as discussed above. The simpler service is likely to impose greater demands on the user to perform functions otherwise performed in the communications network.

For terminal-to-computer traffic, the choice of the most cost-effective communications system depends on a number of variables such as location of host and terminals and traffic characteristics.

Packet-switching is undoubtedly a viable alternative for certain mixes of the variables. For computer-to-computer traffic, the principal alternative to packet-switching is direct connection (dedicated circuits), which is only possible for two or three computers.

Packet-switching provides a number of capabilities not usually otherwise available. The automatic error control results in improved transmission error performance.

The redundancy of alternative routing means greater availability. Data rate and character set conversions permit data exchange between otherwise incompatible terminals and computers. Perhaps most important is resource sharing, i.e., the ability to access over the network different and unique facilities.

A summary of the survey appears in

(Continued on Page S/20)

Providing for Future Unique to Standards

(Continued from Page S/3)

Each has user terminals connected to links in the network. The object is to provide data communication, not only among terminals of one network, but among terminals in different networks.

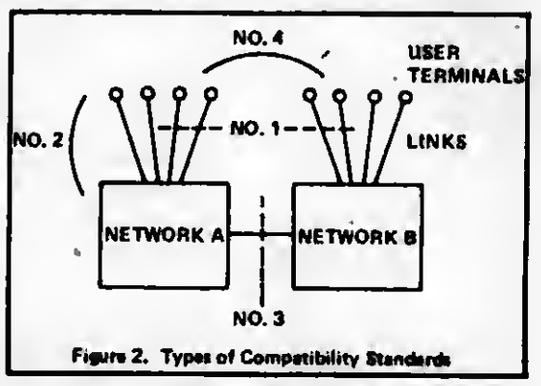


Figure 2. Types of Compatibility Standards

A number of compatibility standards should be considered for the data communication networks shown in Figure 2:

- User-to-link. This standard covers the mechanical and electrical characteristics at the physical interface between terminal and communication line. It includes the definitions of the functions of the signals exchanged over the interface circuits.
- User-to-network. This standard covers the compatibility of procedures or protocols. It includes methods for encoding addresses, for requesting and terminating

(Continued on Page S/16)

Now there's a family of distributed data entry and processing systems that you can tailor to the requirements of your remote sites.

If you've considered the advantages of distributed data entry and processing, you've probably discovered a sad truth:

A system that's fine for Poughkeepsie might be a washout in DesMoines.

Different sites have different needs. From remote data entry, to communications, to remote inquiry and response, to on-site report and forms generation.

And to overwhelm a small branch with high-powered equipment is just as bad as under-equipping a large one.

To match each of your branches with exactly the right equipment, in both hardware and software, there's only one terminal manufacturer to turn to. Us.

We're as flexible as you are.

Using our Sycor Models 340, 350 and 440, and their wide range of peripheral equipment, you can pinpoint capability to site requirements and price.

Our Model 350, for instance, might be just the ticket for your two-man operation in Des Moines. While a larger branch in Los Angeles might require the concurrent background processing capabilities of the Sycor 440.

And, while each of the three terminal systems has its own unique capabilities, they all work together in a remote processing network.

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No matter which of its hundreds of applications you use it for—like order entry, payroll and accounts payable—you're assured of virtually error-free data every time. Because operator errors are pointed out immediately for on-the-spot correction.

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The Model 350.

If you need the advantages of random accessibility, look into the Model 350. The 500,000 "fill-in-the-blanks" characters on its exclusive dual flexible disks let you store customer, product/price and salesman files right at the source.

And, with its 16k bytes of programmable memory, the Model 350 not only retrieves data, but maintains and updates files—and even generates reports.

Just key in a customer number and you get all the pertinent data: name, address and billing information. That means reduced keystrokes, improved accuracy and big savings.

The Sycor 440 System.

When you need more than just data entry, look into our new Sycor 440. With a disk storage capacity of up to 10 million characters and the use of up to eight separate terminals, you can do data entry and inquiry/response concurrent with background processing.

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Data Communications Standards Provide Future Plan

(Continued from Page S/15)

connection through the network and for recovering from unexpected failure conditions. While it is primarily a software or programming standard. it may have a direct impact on the terminal hardware requirements.

- Network-to-network. This requires agreement between the suppliers of communication service rcgarding the link connccting two networks and the associated control procedures. It is normally not of direct concern to a user, as long as he is provided the intcrnetwork capability he expects.
- User-to-user. This includes the end-to-end compatibility requirements for coding, message formats, terminal identification and sccurity. Network standards are often not required here, sincc agreement between two user terminals may provide the compatibility needed.

There are two different types of communication procedures used in these networks. The primary difference, from the user viewpoint, is the steps which occur at the user-network interface. One uses circuit switching, like a voice network. The method involves these steps:

- Request a line and receive a go ahead.
- Key in the identification address of a called terminal (dial).
- Receive response from called terminal.
- Conduct two-way conversation.
- Terminate call.

The second type of network providcs message switching, like a network used to send telegrams. The method involves these steps:

- Compose message.
- Add one or more addresses at beginning.
- Rcquest a line and send one-way message into network, which delivers it.
- At later time receive acknowledgment of receipt of message if that function has been requested.

Work on the development of a new type of data network control, called packet switching, has shown that greatly improved efficiency may be obtained through message switching of relatively small packets of data with decentralized control.

Two kinds of user-network interface standards have bcen suggested:

- Packet interface. Datagrams (like telegrams) are sent into the packet-switching network, across an interface designed to handle those datagrams or packets.
- Virtual call interface. The user in this case perceives that a circuit-switched call is being completed, like a telephone call, even though the network itself may function in a packet-switching mode.

There are two primary organizations conducting international standards development programs today in data communications.

The Consultative Committee for International Telegraphy and Telephony (CCITT) is chartered by the United Nations to provide for integrated and compatible worldwide communications.

Voting membership consists of the common carriers and telecommunication administrations of each participating country.

Every three or four years a CCITT Plenary Assembly is held to give official approval to new and revised recommendations. Many administrations adopt these CCITT recommendations as national regulations and require conformance.

Two CCITT study groups on data have been formed to develop recommendations for approval at the next Plenary Assembly, scheduled next year. One is Special Study Group A. It covers the use of voice facilities for data transmission. The other is Study Group VII, which develops recommendations for public data networks.

The International Organization for Standardization [ISO] membership is composed of the national standards organizations of each of the participating countries.

It has a number of technical committees which prepare international standards in a wide range of technical areas. Technical Committee 97 covers computers and information processing, and its Subcommittee 6 develops standards for data communications.

The CCITT study groups and ISO technical committees with similar interests and objectives work closely in the development of standards. In a number of important areas, they have established whether one group will have primary authority.

In the matter of interface standards, no decision is made without concurrence from both. The meetings of both are attended regularly by observers representing the other organization.

The official U.S. delegations to CCITT study group meetings are formed under the guidance of the Department of State. Preparatory groups meet as required to study issues and to formulate the U.S. positions regarding questions and recommendations in the work program of the study groups.

These U.S. preparatory groups are generally composed of qualified experts from communication common carriers, government agencies, communication users and equipment manufacturers.

ISO participation is organized differently. The American National Standards Institute (Ansi) assigns responsibility for each different subject to a technical advisory group, which develops positions for submission to the appropriate ISO technical committee or subcommittee and determines the makeup of delegations to ISO meetings.

The data communications responsibility is assigned to American National Standards Subcommittee X3S3, which also prepares similar domestic standards for use in the U.S.

In addition, Electronic Industries Association Committee TR-30, which works closely with X3S3, provides important inputs regarding interfaces and related EIA standards.

Issues Studied

CCITT Special Group A studies modem types and interfaces. These are used both on leased lines and on public telephone facilities. Standard modems have been identified and several functional modem interface descriptions have been published by this group.

Recommended transmission rates in bits per second have been established. An attempt is now being made to extend the modem capacity to 4,800 bit/sec on the public-switched telephone network and

(Continued on Page S/19)

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Much Like Railroads

Type of Net 'Traffic' Must Fit Supplier's 'Tracks'

By Ivor G. Kaye
Special to Computerworld

Anyone who has been even remotely associated with data communications over the past 10 years does not have to be reminded of the progress made in this field.

There was a time when a user had a choice between just two possibilties – he either used the telephone network (a service designed primarily for voice, not data traffic) or he leased a private line from the telephone company between Point "A" and Point "B."

Now we have arrived at the point where there are so many different services available from so many different suppliers that most computer users who utilize data communications are somewhat confused.

The large number of "private" digital networks which have sprung up across North America are, in a way, much like a railroad: they can carry only certain types of traffic (the traffic has to fit the tracks). There are, in most cases, severe restrictions on code and speed which must be obeyed by the mainframe or terminals when they are plugged into one of these networks.

Also, just as a railroad line may end at a terminal, requiring freight to be forwarded to its destination by road, so it is with most digital networks. The data normally is transmitted between major centers digitaliy, but has to complete its journey by other means such as analog loops and limited-distance modems which might be compared, in this analogy, to roads and tracks.

What has happened to data communications in North America over the past decade has been – using as charitable a phrase as can readily be found – "disorderly development."

Unless a sensible plan is devised and followed, data communications, as with any other form of transportation, becomes chaotic. Just as railroads and highways carry their traffic quickly and economically, so should communications routes.

The analogy between railroads and highways on the one hand and, on the other hand, communications links such as digital systems and analog "backbone" links is a useful one in that it implies certain questions.

An obvious and important one is "Why not go the whole way by road?" That is, why not use analog facilities and modems in all cases?

The answer is simple: digital systems are more efficient, offer a better performance and can be designed with the versatility to handle anticipated future needs of data communications.

What About the Future?

What, then, will the networks of the future have to offer? How will they affect data processing?

In a recent study on future trends in computer terminals carried out by the Communications Research Centre of Canada's Federal government, some interesting facts may be found. One is that "the cost of logic circuiting will decrease at a faster rate than basic communications."

This will lead to a situation where there is an incentive to carry out more processing at a local level or to carry out sufficient preprocessing to reduce the amount of redundant information to be transmitted. Clearly, this will tend to reduce communications costs.

However, over the next five to 10 years, the cost of basic communications will not be reduced to any large extent. But various changes in tariffs will give the data communications user some price breaks for certain types of digital transmissions.

Basic communications costs will be reduced significantly only when extremely wide-band carriers (such as waveguide and optical fibers) are implemented, and that is still quite a way down the road.

Looking at some of these pointers and bearing in mind the cost of replacing or adding existing plant to the common carriers' networks, at least three important things will happen:

- Digital networks will take over as the prime data communications carrier.
- The digital networks which will emerge will utilize as much existing plant as possible and more use will be made of placing multiple terminals on one loop.
- The digital networks will have built-in intelligence. They will not be code- or speed-sensitive. Also, if the regulatory agencies ever get around to addressing the problem, these networks will have a certain amount of data processing capability and will operate in the mode most suitable for the particular terminals or computers they are servicing, that is, either store-and-forward or real-time.

Digital networks will provide the basis of new developments and applications for computers. An application such as store-and-forward facsimile transmission is a typical example.

The intelligence embedded in the network can take the analog information (generated by a low-cost, low-speed facsimile terminal) and convert this information locally to a digital format. The computer in this location also removes redundant material.

The information can be stored in a conventional manner on disk or magnetic tape and it can be transmitted to a remote location where the computer reconstructs the digital data into its original format before addressing the destination terminals and transmitting the information.

In this example, the intelligence of the computer is used to achieve economical transmission or facsimile information which, for example, if it were sent from coast to coast in its original form, would take at least three minutes per page and cost accordingly.

Using the computer, the printed information can be preprocessed locally and transmitted over the same distance in 25 seconds or so.

The facsimile example is used because, it seems, for at least 25 years, knowledgeable people in communications have been saying that "facsimile is *the* thing for the future."

Serve Narrow Segment

Unfortunately, up to this point in time, the manufacturers have been developing terminal equipment with little or no thought devoted to the network itself. They have ended up with various terminals which, in themselves, can serve only a very narrow segment of users.

Had the industry taken more advantage of the computer and developed a network capable of making terminal usage more economical and more efficient, we would have seen much more use made of facsimile equipment today.

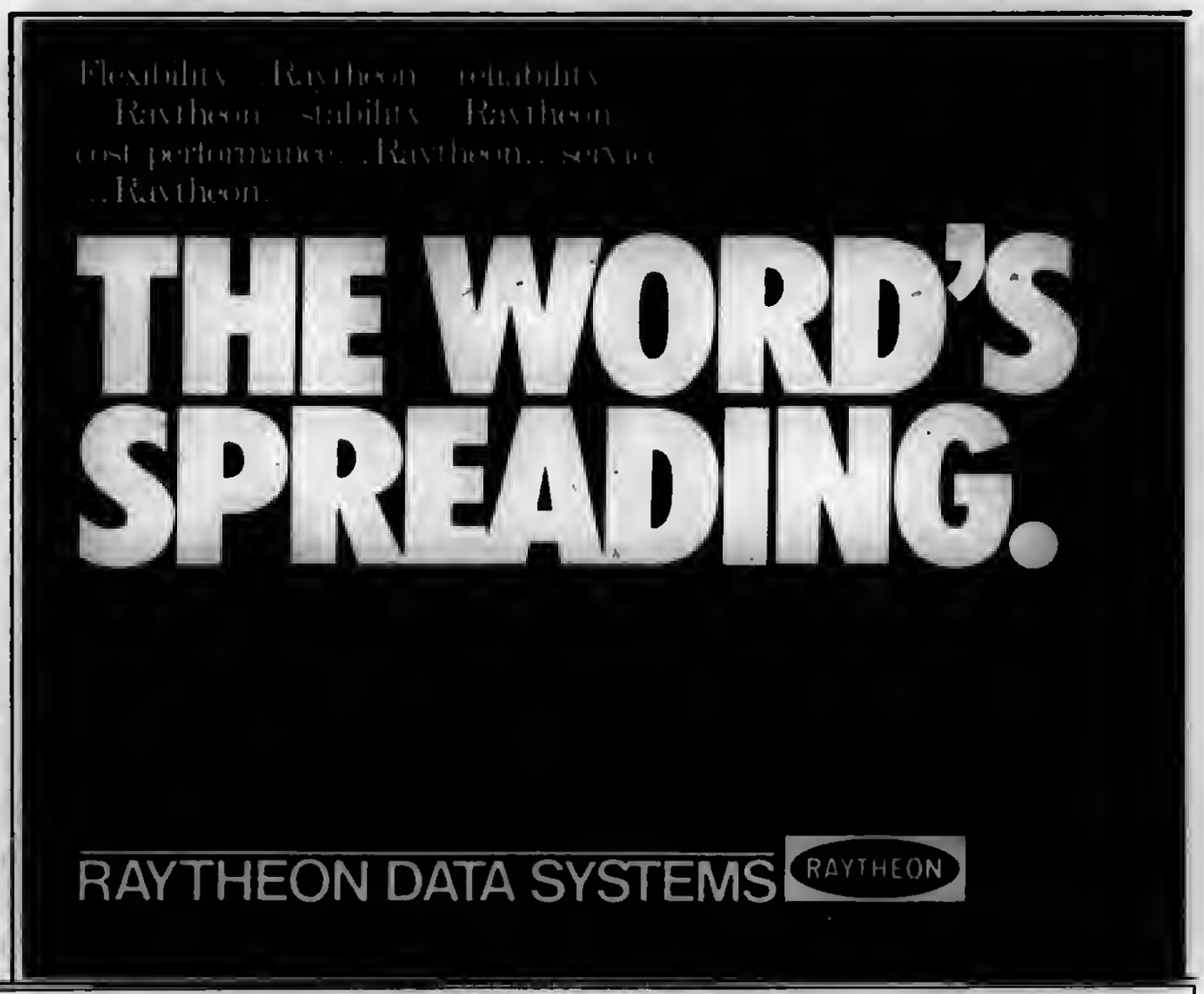
Computer terminals which are virtually 100% digital and which, in many cases, have some intelligence start with a big advantage, but the network of the future must be able to complement these machines and allow the small business operator to have one terminal which may be used for message traffic, local processing and for access to specialized computer installations.

This implies a "master" network must come into existence and will have access to virtually all the "private" networks now in existence. The new network will have to act as a "clearinghouse" and route traffic to the appropriate private network for onward delivery.

There will be no more questions about whether a Burroughs machine in New York can interchange information with a Honeywell machine in Los Angeles. The network will take care of it.

Pause for a moment and consider the number of different types of terminals available today. Every one of them is trying to achieve something that can only be accomplished with real efficiency by concentrating the intelligence within the network.

Kaye is marketing manager of ESE Ltd. in Toronto.



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Systems Linked by Communications Evolved Rapidly

(Continued from Page S/11)
networks operational at the current time. One of these is the Xerox Corp. network that exists within the Palo Alto [Calif.] Research Center (Parc) of Xerox.

This network connects together a large number of terminals and small computers and is used for both internal communications to access the larger machines at Parc as well as to investigate office automation issues.

Another network of the local nature is the Ring network at the University of California at Irvine. This network is used to provide the integrated communications capability to support a distributed computer system composed of mini and micro processors.

In both cases the architecture of the communication system was dictated in large part by the locality of the communications involved and the fact the host machines were mini and micro processors and terminals.

In the future, the role of the new-technology small machines will impact the network-oriented systems even more than they have to date. We see in the research world and in the advanced development stages within the commercial sector a number of emerging technologies which will impact these future directions.

The investigations into intelligent terminals and the appearance of the small processors which look like terminals (the IBM 5100 for example) suggest the computing game will be further fragmented into processing within the terminal to do both those tasks that are efficiently done locally like editing, scrolling, etc. and those tasks which allow the increasingly more complicated distributed computer system that is connected by digital networks to appear to be simple and easy to use by the user sitting at his terminal.

The programming of the terminal to allow it to handle the complex systems that are now accessible will allow the user to ignore the complexity of the environment and to concentrate on the job he has to accomplish. The research in the intelligent terminal area has just this aim.

Network-Oriented Systems

In the network-oriented systems of the near future, the data bases that constitute the operational data will be physically distributed to promote reliability, accessibility and to allow the data and its control to better conform to the structure of the organizations that own it.

The replacement of centralized data (and, as I said before, computing power) has also been made practical by the changing economics brought about by the emerging small-processor technology. The application of these ideas has been undertaken by numerous agencies within the government as well as by the two largest banks in the world.

The evolutionary path of the large-integration solid-state technology guarantees that, in the future, processing capability can be placed wherever it is optimal from the standpoint of the user or the economics of the situation.

In that world it is clear that many effective places for such power are in the areas of the system which are either operating the communication system or are taking advantage of its existence.

Farber is associate professor of information and computer science at the University of California at Irvine.

Bell & Howell's Optical Mark Readers. The beauty of the system is in the simplicity behind its data entry concept. Our OMR reads a pencil mark from a source document directly into computer-ready information. It requires no special skills, no manual keying, no duplicate transcribing and no cumbersome manual edit procedures. And the bottom-line savings are dramatic.

A simple case underlines the point. A major telephone company installed a Bell & Howell Intelligent Mark Reader terminal to process trouble reports and dispatch repair crews. As information is received on the phone, a tab-card trouble report is marked by pencil, placed in the IMR terminal, and automatically checked for errors. The information is then reformatted and transmitted to a central computer where the data is routed to the appropriate service center. The IMR terminal takes 3 hours to provide 100% error-free data entry. The same job originally required 40 hours manual keying, with an unknown error factor. The per-installation salary savings are about $1000 a month. Valuable connect-time requirements dropped from 15 hours monthly to one hour—a savings of around $170 a month per installation. Think of these savings for every one of 28 installations!

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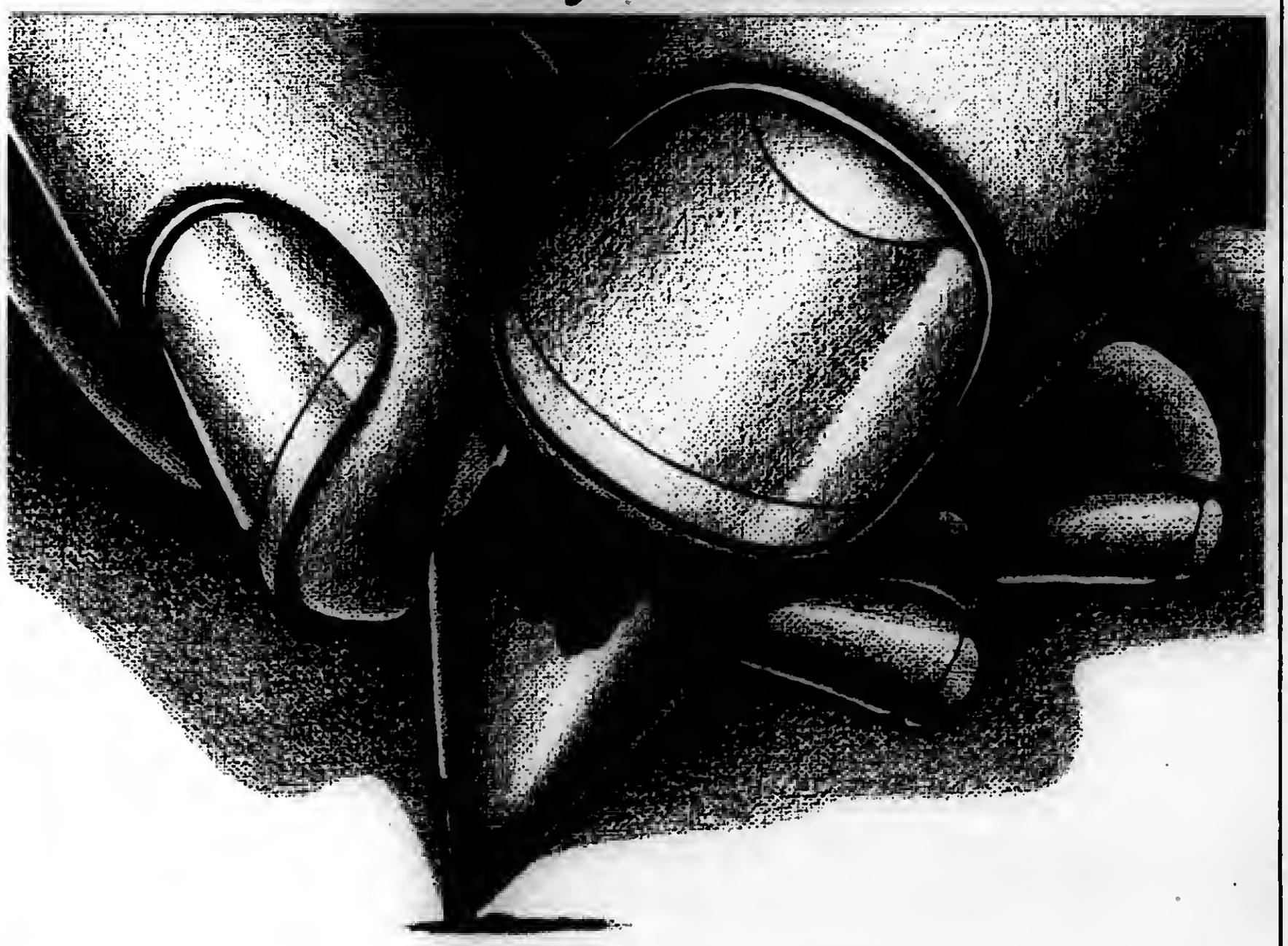
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Architects Linked With Branches

(Continued from Page S/9)
analysts worked in their mathematical modeling and analysis directly on the computer with card inputs.

When these complex analytical services were found to be needed in the remote sites, it was necessary to have a terminal on-line with the system to provide the service capability to the remote offices.

Programming is done on the 40+ in Fortran IV, Level G language under a resident editor program. Programs are compiled and stored in the system and executed when needed. A program often used is the Reynolds, Smith & Hills Hydrologic Simulator.

The program provides for real-time simulation of the rainfall runoff process and stream flow modeling adapted to specific areas of the country. The system provides simultaneous flow routing and water surface profile calculation.

Among other uses of the system, the ICC 40+ terminal is used for accounting purposes, internal billing and management information such as project status.

Reynolds, Smith & Hills' plans for the future, depending on the expansion, will be to eventually link all the field offices and the home office in Jacksonville with remote terminals giving the engineers, analysts and programmers total on-line capability.

Barkley is marketing manager of terminal products at International Communications Corp.

To Ensure Flexibility

Future Planning Unique to Communications Standards

(Continued from Page S/16)

to 9,600 bit/sec on leased lines.

Criteria for testing and evaluating modem designs on actual and simulated telephone facilities are being discussed, with the aim of establishing new high-speed standard modems.

Faults in a communication network can often be located and corrected if loopback connections can be made in response to requests from user terminals. A recommendation for standard loop-testing procedures is being developed.

CCITT Study Group VII

A CCITT Study Group VII recommendation for a public data network interface has been prepared. It is now being studied and improved, to provide for better address signaling, error control and call progress signals. It relates primarily to compatibility between user and network, shown as No. 2 in Figure 2.

An important issue is the matter of character synchronization or timing. Some member delegations believe the common carrier or PT&T administration should always control character timing at the interface.

Others maintain that the originator of a transmission signal should be free to determine character timing. The problem is to assure proper character alignment at the serial bit stream interface.

A good compromise solution is still being sought.

New recommendations have been published covering balanced and unbalanced interfaces using electrical signals compatible with integrated circuits.

A plan is being developed to incorporate these into new complete functional interface descriptions. It will cover the interface identified as No. 1 in Figure 2.

A special working party of CCITT is investigating packet-switching to determine whether international data networks might include or connect to packet-switching systems. It has recommended study of the packet interface and the virtual call interface as possible areas for standardization.

The CCITT Study Group is working on a solution to network-to-network compatibility at the interface shown as No. 3 in Figure 2. It is relying mainly on common carriers and PT&T administrations for the assurance of compatibility between national public data networks.

ISO TC97 Subcommittee 6

A data communication control procedures program is concerned about individual private networks and about the need to interconnect private networks in a compatible way.

In the future, public data networks may use these or similar standards for working between user and network, shown as No. 2 in Figure 2. Current work is on bit-oriented protocols for single-link control.

A standard message structure is nearing final approval and the elements of procedure have been published by the subcommittee for review.

Several programs on public data networks provide for close cooperation and communication between ISO and CCITT Study Group VII. These include work on interfaces, user facilities and fault isolation for public data networks.

The ISO Subcommittee prepares contributions on these subjects which it forwards to CCITT. Thus is serves as one of the important sources of material from users and equipment manufacturers.

An independent study of packet switching is now under way in ISO.

Several activities in Subcommittee 6 cover Data on Voice Networks between ISO and CCITT Special Study Group A. Projects under way cover modem interfaces and fault isolation.

In some cases, ISO standards have been published covering mechanical interface requirements such as connectors and pin assignments for interchange circuits.

The international bodies listed meet about once per year, with working groups covering detailed studies and document preparation between meetings. The CCITT study groups met in Geneva in May and will convene there again just before the plenary session next year.

The last ISO Data Communication standards meeting was held in Tokyo in October 1974. The working groups met in April and a subcommittee meeting was scheduled in Washington in October.

Wheeler is a standards expert on the staff at Xerox Corp. in Rochester, N.Y.

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"We have Datapoint Corporation equipment in many remote areas throughout the country. Several of these small towns are a hundred miles or more from the nearest service personnel. Despite these distances we receive prompt service and do not hesitate to add equipment in any location.

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"Having been one of Datapoint's early customers, we've watched their service organization grow and mature to a point where it is highly responsive and effective. Our Coast-to-Coast locations are all dispatched from the Central Call Center and a Datapoint Area Service Manager calls me if there is ever any unusual problem at a remote site.

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JAMES GRESHAM
Director of Client Service
and Conversion
Medical Computer Systems, Inc.
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To Compare Capabilities

Study of Networks Proves Useful to Potential Users

(Continued from Page S/15)
Figure 1. The figure shows the major user-oriented characteristics of each network as far as can be determined.

Arpa Net

The Defense Advanced Research Projects Agency computer network (Arpa net) is the only existing packet-switching network of its size. Participation in Arpa net is limited to Arpa contractors in support of their work for Arpa and military organizations for reserach and development purposes.

The network comprises packet switches known as Interface Message Processors (IMP) and a great variety of computers or hosts. Each IMP is connected to two or possibly three or four other IMPs to form a distributed network and supports one or more hosts.

An augmented IMP, the Terminal Interface Processor (TIP), can additionally support terminals directly.

The network was begun in 1969 and entered an operational phase in 1971. Currently the network includes between 45 and 50 IMPs or TIPs, about equally divided, and over 50 hosts. In addition to nodes in the continental U.S. there are also a node in Hawaii and two in Europe.

The IMP communications subnetwork provides for the delivery of messages of up to about 8,000 bits from one host to another host. The messages are partitioned into packets of about 1,000 bits for transmission through the network and reassembled in the correct order at the destination IMP.

Hosts near to an IMP are connected by an asynchronous bit-serial interface requiring special hardware at the host side. Messages are transmitted between host and IMP in full-duplex.

Hosts at greater distances can be connected to an IMP by a communications line in which case special error-detecting hardware and software is required at the host side.

In this case, packets are transmitted between host and IMP. The TIP can support a variety of terminal devices, transmitting characters asynchronously at speeds up to 19.2 kbit/sec.

Host-to-Host Hookup

Communication between hosts is conducted according to a host-to-host protocol, which is implemented as a Network Control Program (NCP) in each host. The NCPs control the establishment of logical connections between executing programs; exercise flow control over the connections; and construct and interpret headers at the beginning of each message.

Additional protocols have been defined and programs implemented using the NCP to provide network user capabilities. One of these, the Telecommunications Network (Telnet), enables a terminal at one host or a TIP to establish a logical connection to a host elsewhere on the network and appear as a local terminal at that host.

A file transfer capability enables the movement of files from one host to another host. A message service enables a terminal user to send a message to users at other hosts on the network; messages are stored in the recipient's mailbox file.

The above three capabilities are implemented on practically all Arpa net hosts and used extensively. Other less widely implemented functions include remote job service, whereby jobs can be submitted from one host for execution on another, and graphics, in which a graphics terminal at one host can interact with a graphics application program on another host.

Claims as to the cost-effectiveness of the network have been made, although some of the assumptions used to derive the figures have been questioned. Users have not yet been charged for the traffic they generate on the communications subnetwork, but this is possible in the future.

The communications subnetwork is used particularly inefficiently by the numerous PDP-10 Tenex hosts on the network, which expect terminal intput a character at a time and perform echoing at the host.

The number of packets on the network is also influenced by NCP implementation features such as the flow control system.

Cigale/Cyclades Net

Cyclades is a computer network linking 16 heterogeneous computers in universities and research centers in France with a 7-node packet-switching network. Cyclades is intended to be both an operational tool for government use and a prototype for network experimentation in vari-

(Continued on Page S/21)



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"They did, did they? And just which of our esteemed competitors lays claim to knowledge as vast as our own?
"Well, NCR, Computer Automation, Microdata and Modcomp all use the 580. To name just a few, Sir.
"NCR, hmmmm. Tell me more about this machine.
"Yes Sir! First of all the production standards are impeccable. Seven days burn in at elevated temperatures plus AQL and CQL programs which mean a triple quality check. Quite remarkable when you're producing 1000 units a month.
"Please continue Mr.....
"Bascomb, Sir. Well, standard features include a numeric pad, XY addressing and full cursor controls. Not to mention the sharpest, most readable screen in the industry!
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"Yes, yes, yes. Tell me Bascomb, how's your croquet game?"

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Study of Nets' Capabilities Proves Useful to Users

(Continued from Page S/20)
ous areas, including distributed data bases.

Cigale is the name of the packet-switching communications network within Cyclades. Cigale is a simple packet switch, analogous to the datagram.

In partlcular, there is no end-to-end flow control, error control or sequencing. Those functions are included in the host-to-host protocol.

In Cigale, the host address space is independent from the network topology. Hosts may be connected to several nodes (i.e., dual homing), and several host addresses may be reached over the same line. The latter allows several logical hosts such as distinct host protocols within the same host, several virtual hosts (as in IBM-CP67) or several hosts reached through a front-end computer to be connected on the same line.

Hosts are assumed to be located at some distance away from a Cigale node, requiring connection via leased lines. Transparent binary synchronous communications are used between a host and Cigale.

Consequently, no modifications to host operating systems are necessary, and host-to-host protocols may be implemented as user programs. The ISO standard 16-bit cyclical checksum is employed.

Cigale has no terminal-handling facility for attaching terminals directly. However, a terminal concentrator or minihost has been developed to provide access to the network to users not attached to a host. The terminal concentrator uses the Mitra-15 minicomputer which is also used for the packet switches in Cigale.

Spain's CTNE

The Compania Telefonica Nacional de Espana (CTNE), as the public carrier in Spain, has opened a public packet-switching service with exchanges in Madrid and Barcelona. About 500 terminals are connected to the network at present, the major user being the banking community.

Two distinct services are provided by the network: real-time and message-switching services. The real-time service is directed to closed groups of users, in which the traffic transmitted by/toward a terminal is directed toward/from a determinate host computer, without possibility of direct traffic between the terminals.

This service has a fixed address, which means the messages generated by one terminal will always go to the same host computer.

The message-switching service also serves closed groups of users. It enables an exchange of messages between any two stations (terminals or computers) or a closed group.

In contrast to the real-time service, each terminal can communicate with any other in the same closed group. The network adjusts the message to the condition required by the destination stations, providing code change, speed change and packet arrangement change if necessary.

Terminals are connected to the packet switches by concentrators and multiplexers. In the real-time service, the messages generated by a terminal always have a fixed address; therefore the packets do not have headers between terminal and concentrator. Once this packet reaches the concentrator, a 56-bit header is added and remains until the packet reaches the host computer.

DDX-I

A system integrating circuit switching and packet-switching has been developed by Nippon Telegraph and Telephone (NTT) in Japan. An experimental switching system DDX-1 (Dendenkosha Data Exchange) has been designed and implemented; DDX-1 uses time division multiplexing to dynamically share the wide-band line capacity between circuit switching and packet switching.

One of the features of DDX-1 is the signaling sequence that occurs when a call is placed which allows the caller to select either a circuit-switched or packet-switched call.

If both calling and called terminal are of the same speed and do not require store-and-forward service, both terminals are served by circuit switching. If they have different speeds or require the store-and-forward service, they are serviced by packet-switching.

European Informatics Network

The European Informatics Network (EIN) project originated within Cooperation Europeenne dans la Domaine de la Recherche Scientifique et Technique (Cost) and was formerly known as Cost Project 11. Countries associated with the project are France, Italy, Norway, Portugal, Sweden, Switzerland, the United Kingdom and Yugoslavia, together with Euratom. The project is developing a private packet-switching network with nodes at London, Paris, Zurich, Milan and Ispra (Euratom).

Although the agreement to establish the project was signed in November 1971, it did not come into force until ratified by two-thirds of the participants, which occurred in February 1973.

Since then, most of the effort

(Continued on Page S/23)

	Arpa Net	Cigale/ Cyclades	CTNE	DDX-1	EIN	EPSS	NPL	RCP
Country	U.S.	France	Spain	Japan	Europe	UK	UK	France
Membership	Private	Private	Public	Public	Private	Public	Private	Public
Type of Packet Service	Virtual Circuit	Detagram	Virtual Circuit	Virtual Circuit	Datagram	Virtuel Circuit	Detagram	Virtual Circuit
Host Interface Type	Non-standard	Binary Sync.	Serial Sync.	HDLC	HDLC	Non-standard	British Standard	Serial Sync.
Maximum Speed	200 kbit/sec	48 kbit/sec	N/A	48 kbit/sec	130 kbit/sec	48 kbit/sec	N/A	4.8 kbit/sec
User Input	Multi packet	Packet	Packet	Packat	Packet	Packet	Packat	Packet
Terminal Interface	Yes	No	Yes	Yas	No	Yes	Yes	Yas
User Input	Cheracter	—	Packet	Character	—	Character	Character	Character
OS Modification	Yes	No	N/A	N/A	No	N/A	Yes	N/A
User Capabilities:								
Terminal-to-Computer	Yes	Yes	Yes	Yas	N/A	Yas	Yes	Yes
Computer-to-Computer	Yes	Yes	Yas	Yes	N/A	Yes	Yes	N/A
Economics Considered	Yes	No	Yes	Yes	No	No	No	No

N/A = Information Not Availeble

Figure 1. Summary of Network Characteristics

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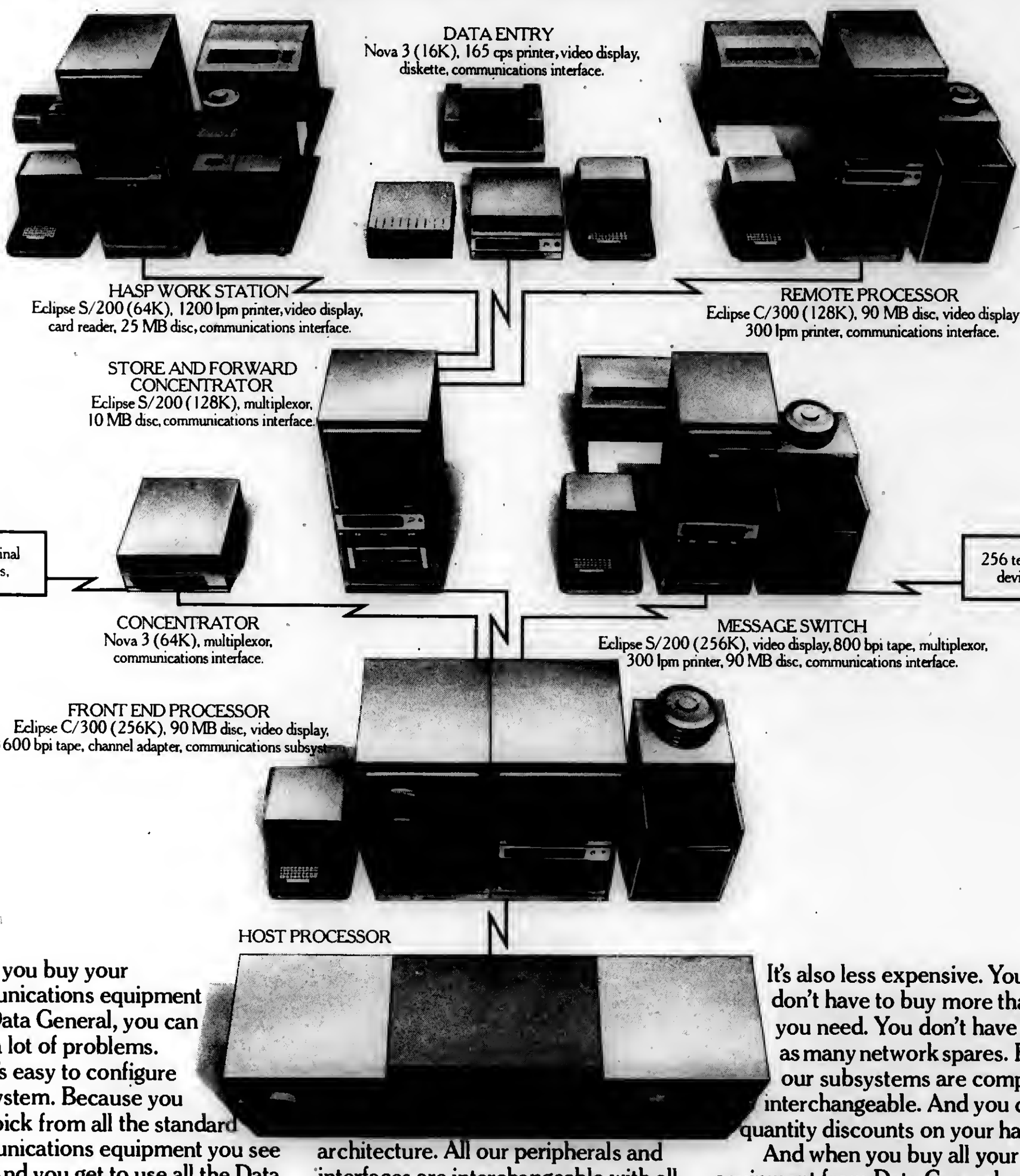
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Study of Eight Networks' Capabilities Proves Useful

(Continued from Page S/21)

has been in preparing a specification for the packet-switching communications subnetwork and in selecting a contractor.

The group preparing the specification for the communications subnetwork was faced with the decision about where the boundary between the user and the subnetwork should occur.

The choice of boundary position determines which functions must be performed by the subnetwork and which are the responsibility of the user.

There is some variance among existing networks in this area. Eventually, it was decided to define a basic subset of facilities which would be mandatory and another subset of facilities which were optional in use but had to be considered in the initial design. The connection between host and packet switch is to be full-duplex with error detection.

The EIN subnetowrk is of the datagram type, with no end-to-end control. Protocols at the host-to-host level are presently being defined.

As an international research project, the EIN project is not addressing the economics of packet-switching. However, the project is contributing to the development of standards, the interconnection of packet-switching networks and the knowledge of packet-switching in the participating countries.

Britain's EPSS

The British Post Office (BPO) is currently implementing the Experimental Packet-Switched Service (EPSS) as an experimental public packet-switched network which will provide data to both customers and the administration on the practicality and viability of packet-switching for future data communications.

The BPO prepared the specification and contracted with Ferranti Ltd. in mid-1973 to implement the packet switch within two years.

The experimental network will comprise three nodes or PSEs, one each in London, Manchester and Glasgow. In fact, the PSE at London will comprise three independent modules or Packet-Switching Units (PSU) to improve availability; the PSEs at Manchester and Glasgow each comprise two PSUs.

The nodes will be linked by 48 kbit/sec lines, initially analogue but later digital.

Each node will be provided with a number of ports to allow the connection to the system of two separate categories of customer terminals.

One category is packet terminals, capable of constructing, transmitting and receiving standard format packets. The other category is character terminals, capable of operating only in character mode. For such terminals, the local packet-switching exchange is required to assemble characters into packets and break down packets into characters.

Lines to the packet terminals will vary from 2.4 kbit/sec to 48 kbit/sec synchronous; lines for character terminals vary from 50 bit/sec to 300 bit/sec asynchronous.

The BPO specification sets particularly stringent requirements for reliability of the packet switches which are being met by multiprocessor packet switches.

The packet protocol is based on the concept of a call. A call is set up by the calling terminal generating a "call-originating" packet and the called terminal responding with a "first-response" packet. Further packets in the call are called "subsequent" packets.

Packets between a PSE and a customer packet terminal comprise a header and data. When a packet arrives at a PSE from a customer packet terminal, it is converted into a form suitable for transmission on the EPSS network by attaching a "main network addition" to the packet immediately after the data.

The main network addition is removed by the destination PSE before the packet is delivered to the terminal. The length and content of the packet header and the main network addition are different for the various types of packets.

The PSE-to-customer packet terminal line transmission protocol allows packets to be transmitted simultaneously in both directions, but second packets cannot be transmitted until the first is acknowledged.

High throughput is achieved by generating and transmitting the acknowledgment two byte times after receiving the checksum. The acknowledgment is transmitted at the fixed time in the transmitted data stream, even in the middle of a packet.

NPL Data Communication Network

Research in packet-switching networks at the British National Physical Laboratory (NPL) predates Arpa net, having commenced in 1966. NPL has implemented on the laboratory site a data communications network which comprises one node of a packet-switching network to which a large number of computers and terminals are attached.

Host computers (known as user machines) communicate with the packet switch by sending and receiving packets over a full-duplex link. The packet switch offers a datagram type of service but the host-to-host protocol creates a virtual circuit.

Each host is connected to the packet switch via a special interface or Network Termination Unit (NTU) which is physically adjacent to the host. The NTU is connected to the host by a pair of standard interfaces (BS421) and the NTU can exchange special status signals with the packet switch to control the flow of packets.

Terminal devices can access the network directly by means of the terminal processor (TP) which appears logically to the packet switch like a user machine.

In fact, the terminal processor coexists with the packet switch like a user machine.

The packet switch and terminal processor are implemented in a 32K Honeywell 516. It has a duplex processor for reliability, providing a cold standby. Throughput is about 1 million packets per day with a peak performance of 5 million bit/sec.

Approximately 12 computers and 85 terminals are connected. One of the host computers, also a Honeywell 516, controls a central file store comprising 60M bytes of disk storage.

The Reseau a Commutation par Pacquets (RCP) is being developed by the French Postal, Telephone and Telegraph (PTT) authority. RCP Is an experimental prototype network which is expected to result in the definition and implementation of a public packet-switched data transmission service. The initial configuration of RCP consists of three packet switches, in Paris, Rennes and Lyon, and three time-division multiplexers, each connecting a distant city to a packet switch.

Customer computers have access to the network through 4,800 bit/sec transmission lines over which they can have several interleaved conversations with other computers and/or terminals.

'Virtual Circuits'

Data transmission is based on the establishment of full-duplex "virtual circuits" between pairs of customers. The virtual circuit is characterized by flow control at both ends and a low undetected error rate.

Over such a virtual circuit, data is transmitted as a sequence of 8-bit bytes with interspersed end-of-message markers. The number of bytes between two end-of-messages is arbitrary. Messages may be split into packets or grouped consecutively within the network, but the sequence order of data bytes and the position of end-of-message markers is guaranteed at the destination.

The packet switches are PDP-11 Models 20, 21 and 40, each with 24K words of memory. Fixed routing is used and a fixed buffer allocation is assigned for each virtual circuit of 32- or 256 byte/node depending on class of service.

A call request is required to set up a virtual circuit. A call request includes the address of the called customer, the address of the calling customer, a collect call flag which if set indicates thc called customer is to be charged for the call and a class of service indicator.

Two classes of service are defined: low-peak throughput calls with less than 120 byte/sec and high-traffic calls with peak throughput above the limit.

Wood is a staff member with Mitre Corp. in McLean, Va.

Carrier Proliferation Offers Users Options

(Continued from Page S/14)

transmission techniques, including modem-sharing devices, port sharing devices, split-stream modems and inverse multiplexers will enable the same applications mixture to be accommodated at lower cost than the current configuration.

Such possibilities do not always exist. But in many situations, the relatively low cost of these building blocks makes it easy for users to find substantial savings resulting from their usage.

In networks of at most a few dozen terminals the networking layouts which should be used with such techniques are usually obvious. In more complicated networks with a larger number of terminals, the use of computerized design approaches and the evaluation of numerous different combinations of line routines, transmission speeds may be the most sensible approach.

Doll is president of DMW Telecommunications Corp. in Ann Arbor, Mich.

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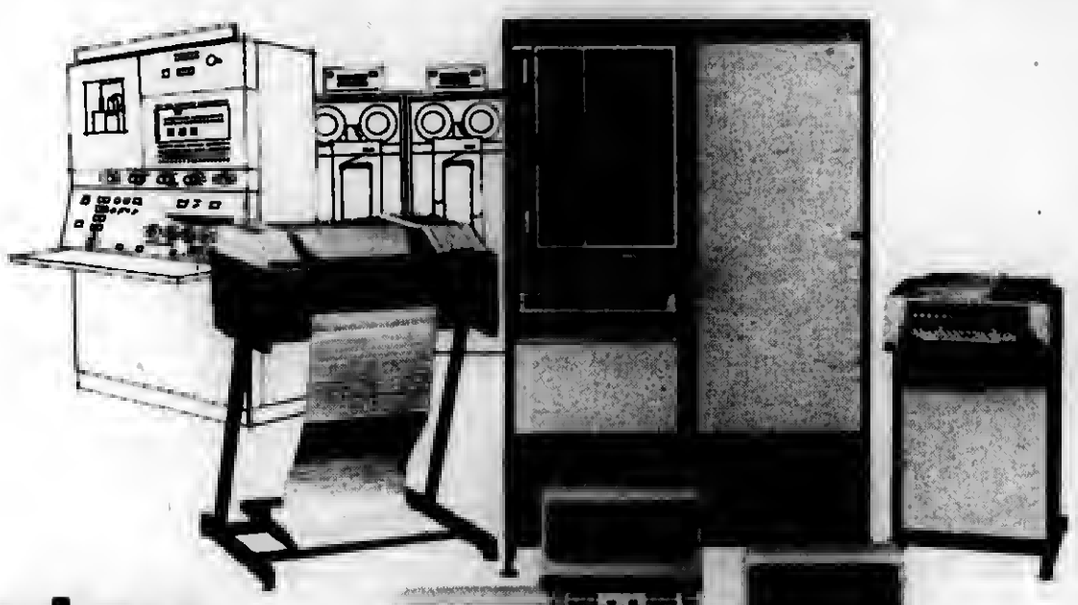
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MINIWORLD

Mini Bits

PDP-11s Get Add-On Memory

FORT LAUDERDALE, Fla. – Core memory capacity of Digital Equipment Corp. PDP-11 minicomputer systems may be increased to as much as 124K words with an add-on memory system recently announced here by Standard Memories, Inc.

Designated the Ecom H-11 system, the product is available in two rack-mountable configurations. The smaller unit, with a capacity up to 64K in 16K increments, fits into a standard 5-1/2-in. rack. The larger version can accommodate up to 256K in 16K increments and fits into a 12-1/2-in. rack. Full memory cycle time is 750 nsec, minimum.

H-11 systems are immediately available at single-unit prices of $3,225 for 16K, $7,865 for 65K and $15,715 for 124K.

Okidata Offers HP Interface

MOORESTOWN, N.J. – Users of the Hewlett-Packard (HP) 2640A CRT terminal can now tie their display unit to the Okidata CP 110 (110 char./sec) printer by the use of a plug-compatible interface package from Okidata Corp.

The interface, including six feet of cable and an HP connector, provides direct access to the 60 line/min capabilities of the Okidata printer, enabling it to operate like the 9866A line printer, according to Okidata

The printer/cable interface in quantities from one to nine is $1,500 for the roll-paper model and $1,710 for the tractor-feed model. OEM discounts are available, the firm said from 111 Gaither Drive, 08057.

SA Delivers 10,000th Disk Drive

SUNNYVALE, Calif. – Shugart Associates (SA) has announced the delivery of the firm's 10,000th flexible disk drive unit.

The drive was delivered to Datapoint Corp.

Interdyne Formatter Bows

VAN NUYS, Calif. – Interdyne Co. has announced an add-on formatter card module that makes parallel interfacing to microprocessors and minicomputers easier when employing the IC 2400 digital cassette tape drive.

The single card has the features of the IBM-compatible drive formatters and is compact enought to attach to the drive as a second card and adds only 2 in. to the depth. It provides serialization and deserialization of 8-bit byte data, preamble and postamble generation and stripping, bi-phase (Manchester II) encoding and decoding and request/acknowledge handshaking (Tristate).

30% Faster Than Model 7/16

Interdata Enters Low-End Processor

OCEANPORT, N.J. – Interdata Inc. has announced a 16-bit processor at the low end of its product line. The company said the unit costs less than the comparable Digital Equipment Corp. (DEC) PDP-11/04 or 11/05, or the Data General Corp. Nova 3.

Called the Model 6/16, the minicomputer is said to be 30% faster than the compatible Interdata Model 7/16. It is also lower in price, an Interdata spokesman said.

While the 8K-core version of the 7/16 costs $3,200, the comparable 6/16 costs $2,800, a spokesman noted. The 7/16 will, however, continue to be in production.

The Model 6/16 is available in either core or MOS memory. It is program- and interface-compatible with the entire Interdata computer line and can run any of the company's operating systems, a spokesman said.

Core memory cycle time is 1 μsec. MOS semiconductor memory cycle time is 500 nsec. Maximum memory capacity is 64K.

The Model 6/16 includes a task-oriented, 104 instruction set; 16 general-purpose registers, 15 index registers, four high-speed direct memory access channels and vectored hardware interrupts to handle up to 225 I/O devices.

Instruction times range from 900 nsec for register-to-register operation to 10 msec for fixed-point multiply with an optional multiply/divide feature.

The 6/16 is available in an eight-slot chassis with 25 amp or 50 amp power, Interdata said. A 16-slot, 50-amp version is also available.

The Model 6/16 can also be field-expanded to a compatible 32-bit Model 7/32 computer, the spokesman said.

Software includes OS16MT2, a real-time-based multitasking multiprogramming operating system; OS Assembler; Fortran IV and V; OS Aids, an interactive debug program; and CAL, a common assembly language for all Interdata processors.

Interdata also offers a Basic interpreter that is a superset of Dartmouth standard and OS edit, a text editor.

The 8K-byte core versions cost $1,736 in quantities of 100 and are immediately available. The 6/16 processor with 8K bytes of MOS memory costs $1,364 in quantities of 100 and will be available next spring.

Interdata is at 07757.

Disk Drive Available From GIC

HAWTHORNE, Calif. – A head-per-track disk memory has been introduced by General Instrument Corp. (GIC) that costs $3,985 for 1M bytes of memory.

Called the Series 700, GIC's random-access disk drive will be offered in increments of 32 tracks up to 128 tracks. It will feature an average access time of 8.5 msec, 3,600 rev/min and a data rate up to 4.5 mHz. Capacity is up to 19.2M bits.

The Series 700 uses a modular design concept. It is a completely self-contained system packaged in a 7-in.-high rack-mounted chassis. It fits a standard 19-in. EIA rack.

Head assemblies are interchangeable. They can be replaced in the field without optical interlacing alignment, the firm said. Seventeen-track recording assemblies are located on both surfaces of the disk.

Track sparing is manual and two prewritten clock tracks are provided. One head is active, one inactive, giving users an available spare clock track.

Another feature is the filtering technique. Positive clean air is circulated through the disk and recording areas while the disk is rotating.

Air enters the front of the drive through an absolute filter and is directed to the center of the drive.

Three circuit boards are used. Each can be tested independently. They include digital circuits, analog circuits and power supply. The intercoupler circuit is mounted on the board at the rear of the drive and takes virtually any interface. Daisy chain is done in a multiple drive configuration, according to the firm at 13040 S. Cerise Ave., 90250.

Lower Cost/Bit Reduces Price on V76

IRVINE, Calif. – A 62% price reduction in equally equipped computer systems resulted when Varian introduced its V76 computer featuring an $8,900, 64K-word, 600-nsec semiconductor memory.

The $45,550 reduction is the difference between a V73 computer with 128K words of 660-nsec core memory plus memory management system for $74,000, and the V76 computer with 128K words of 660-nsec semiconductor memory including CPU, power supply, memory management system and options for $28,450, Varian said.

Memory is the key with 64K words on a single board and the use of 16-pin, 4K, N-channel MOS random-access memories (RAM) which bring the cost per bit down to 85 cents. Lower power consumption and high packing density of these RAMs combine to significantly reduce power supplies and chassis requirements, the firm said.

This dual-ported memory comes in 32K-word and 64K-word increments and is available with or without parity. The 32K modules sell for $4,800, and parity options are available for $500 per 32K words of memory.

V76 computers are fully software-compatible with all other V70 series computers, though the latest memories are available only in V76 models, the firm said.

The V76 includes memory parity logic, expanded instruction set with byte manipulation, multiply/divide, automatic bootstrap loader for Teletype, I/O bus with direct memory address and programmers console and is available in a 7-in. or 14-in. chassis. Both sizes permit memory expansion up to 256K words in the basic computer chassis.

(Continued on Page 24)



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Conversion Not Easy Process, But Firm Pleased With Results

By Mal Stlefel
Special to Computerworld

TACOMA, Wesh. – The Pacific Northwest headquarters of Reichhold Chemical, a manufacturer of synthetic resins and industrial chemicals, is in the process of converting its programs and files from a five-year-old Hewlett-Packard (HP) 2000-based business system to a faster HP 3000 configuration.

The older installation, purchased jointly with systems/software/time-sharing house Computer Solutions, Inc. (CSI) of East Orange, N.J., replaced Reichhold's tab room operation to accommodate the company's increasing data processing load in 1970.

CSI helped Reichhold get started by writing programs for the initial inventory and payroll applications; CSI also used the system in its time-sharing service bureau operation. Reichhold became full owner of the equipment when CSI closed its Washington office.

Rather Switch Than . . .

The decision to switch was made when Reichhold began running out of disk space for many applications, especially in time-sharing mode, according to Lorraine Franich, DP supervisor.

Management had considered additional drives for the 2000, but when it began to dig into the situation, more problems were unearthed.

For one thing, Reichhold had been experiencing difficulties with the flock of vendors maintaining the hardware: HP for the CPU, card reader, magnetic tape drive and paper tape unit; Information Storage Systems for the disk drive; and Sorbus, Inc. for the Data Products printer.

Sorbus had trouble servicing the printer because its personnel weren't familiar with it, Franich said.

She also cited unexplained CPU crashes which forced the operators to reenter the day's work onto a backup disk pack.

For another thing, users found they couldn't run batch and time-sharing jobs simultaneously, so batch work had to be run by the second shift programmer.

Nevertheless, management "was satisfied with Hewlett-Packard, and it had what we wanted," Franich explained. Thus, the company spoke with other minimakers, but decided to remain with HP.

Paper to the Rescue

Some revealing and annoying difficulties have arisen in the conversion process, begun two months ago. The only feasible medium for data transfer from the old disk packs to the new has been punched paper tape.

Apparently, neither the tape drives nor the disks on the two machines are electrically compatible, the old system didn't have a card punch and no one was found who could help with a 2000 disk to 3000 disk copy.

So Reichhold had to settle for the paper tape technique and it has had to spend some time and effort correcting errors introduced by the tape punch.

Source programs written in Basic have been converted with minor changes in job control instructions. The programs written in HP 2000 machine language haven't been converted yet, but Franich doesn't anticipate any significant problems, except for the expected editing by the tape punch.

Future applications on the HP 3000 will include accounts receivable and accounts payable in addition to the payroll, inventory and sales applications and various calculation programs used by Reichhold's engineers.

The company is planning to replace its home-grown payroll package with one sold by HP.

V76 Lower Cost/Bit Reduces System Price

(Continued from Page 23)

The 7-in. chassis models sell for $5,400, and 14-in. models sell for $6,000. Both prices are for quantities of one, and deliveries are scheduled for the first quarter.

The memory with its 4K RAMs is designed for compatibility with future 16K RAM devices – permitting a four-fold capacity increase. Mostek, National and Fairchild supply the 4K RAMs.

Further memory-related product announcements are anticipated early in '76 from 2722 Michelson Drive, 92713.

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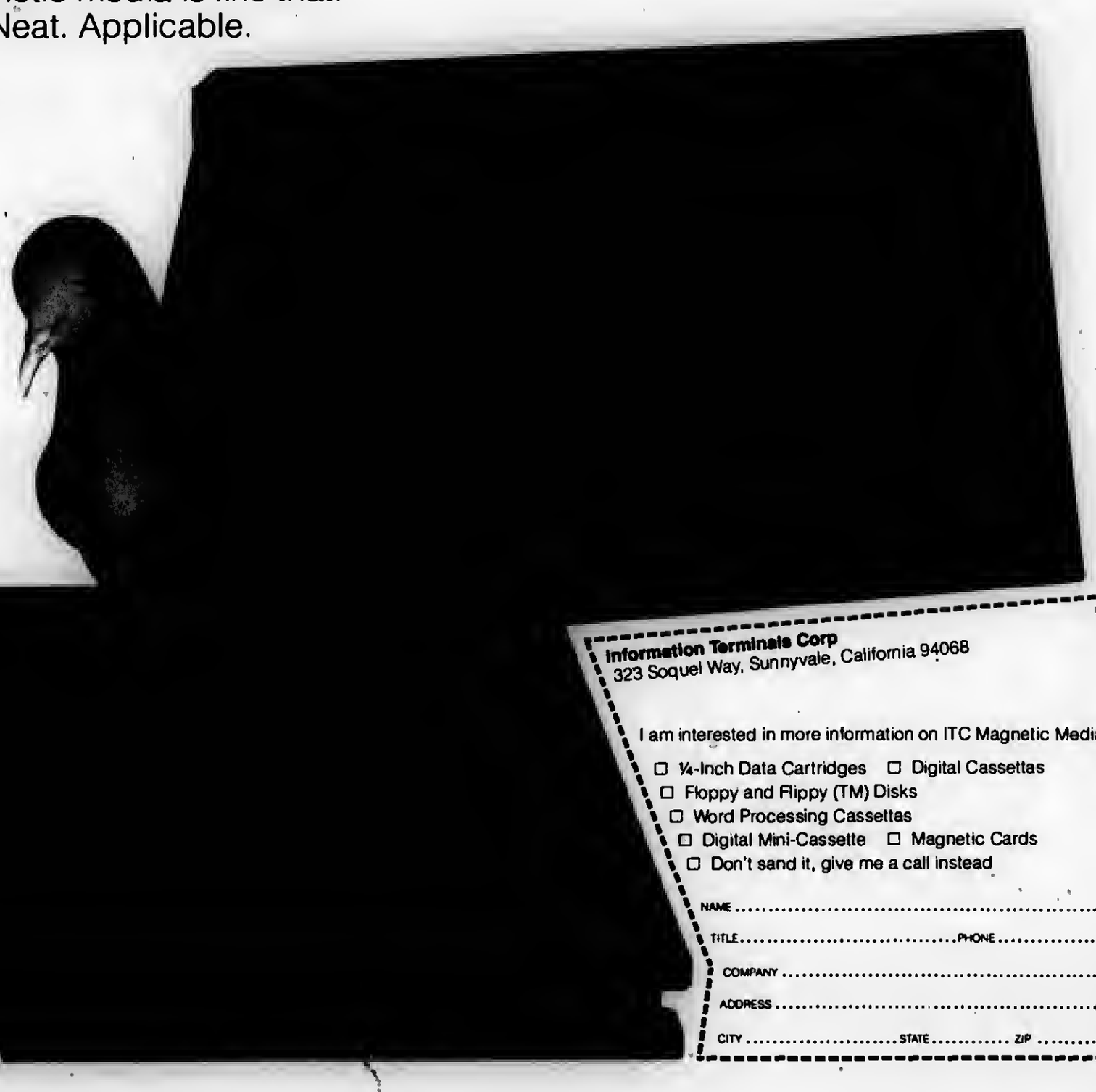
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Mini-Based Net Processes, Stores and Transmits ECGs

MARSHFIELD, Wis. – A mini-based data communications network has gone into operation at Marshfield Clinic here to process and store several hundred electrocardiograms (ECG) each day.

Approximately 50 to 70 of the ECGs are generated at Marshfield Clinic itself; the remainder are transmitted over telephone lines from several remote sites throughout Wisconsin. Even though the computer center is in an adjoining room, the Marshfield ECGs are transmitted in the same fashion as the ones from the remote sites.

Developed at a cost of $250,000, the network is intended primarily as a service for local medical agencies which provide the clinic with referrals. Participating agencies pay a minimal charge per ECG for the services of the network and Marshfield Clinic's seven cardiologists, who read the computer analyses of the ECGs to check their validity and add comments on any abnormalities or situations requiring special treatment.

Systems-engineered by Marquette Electronics of Milwaukee, the network centers around a Model 70 minicomputer from Interdata, Inc. Analysis of the incoming ECGs is done by a Mayo Clinic program designed by Dr. Ralph Eugene Smith.

Faster Than IBM 360

Although the Mayo program used at Marshfield is the IBM 360 version, according to Marquette systems development manager, Mike Schwartz, the minicomputer executes the routine faster than several different configurations of the much larger IBM mainframe.

The Mayo program utilizes 34K bytes of core memory in the Model 70, along with 16 overlays, and runs in 15 to 25 sec, depending on the number of the ventricular complexes.

The same program executed on an IBM 360/30, using 64K bytes of core memory, takes 50 to 65 sec. On an IBM 360/40, the Mayo program runs in 45 to 55 sec, and on an IBM 360/50 in 20 to 40 sec.

"We can process data faster than we can acquire it," Schwartz said. "We have a software routine to queue incoming ECGs on our Diablo disk, but that capability was designed into the system at a time when we thought the Model 70 would take a minute or longer to run the Mayo program. We now find that we don't need a queuing capability."

In operation, the Marquette system at Marshfield Clinic begins with the medical technician attaching electrodes to the patient, then dialing into the system.

After hearing a signal that the computer is available and on the line, the medical technician presses a button to transmit patient information, including an identification number, date, age, weight, height, sex and any prescription drugs the patient may be taking.

Another signal acknowledges receipt of the patient information and cues the technician to set the switch on the Marquette Series 2000 C-209A Patientransmitter for automatic transmission of 20 sec of ECG data in a three-channel format.

Simultaneously, with the transmission of this data, the unit produces a hard-copy tracing for on-the-spot examination by the local physician.

When it arrives at the computer center in Marshfield Clinic's cardiology department, the three-channel signal is recorded on an analog tape recorder, which is linked to a Marquette C550 writer/printer. The C-550 generates a second hard-copy tracing.

The analog tape recorder offers redundancy to the system front end; in the event of a computer problem, incoming ECGs are recorded in analog form and saved for batch processing when the computer is back on line.

An analog-to-digital converter in an adjoining Marquette S7100 card recorder simultaneously feeds the digitized data to the Mayo program in the mini and to the card recorder for generation of a magnetic data card.

Two magnetic strips on the card retain the three-channel ECG tracing, the analysis by the May program and any comments added later by a cardiologist.

When reading the line printer's output, the cardiologist jots down his comments directly on the hard copy produced by the line printer. Later that day, a secretary transmits comments on a Transistor Electronics Corp. CRT terminal for incorporation back through the computer to the S7100 card processor.

Western Digital Adds MCP-1600 Micro

NEWPORT BEACH, Calif. – A 16-bit, N-channel silicon-gate microprocessor has been introduced by Western Digital Corp.

The MCP 1600 microprocessor can be microprogrammed for control applications or programmed to emulate popular minicomputers, "the main target of bipolar slice technology," according to the firm.

Originally developed as the chip set for Digital Equipment Corp.'s LSI-11 microcomputer, the MCP 1600 internally processes data words in 8-bit segments even though it has been designed as a 16-bit machine. The processor consists of the CP 1611B data chip, the CP 1621B control chip and the CP 1631B microinstruction control read-only memory (Microm) chip.

The three chips are interconnected by an 18-bit microinstruction bus that provides bidirectional communications between the chips for addresses and microinstructions. An additional data access uses a 16-bit port for communicating with memory, I/O devices and other system components.

The CP 1611B data chip includes the arithmetic logic unit and 26 8-bit registers. Address generation for fetching microinstructions and control signals for the data access bus is supplied by the CP 1621B control chip.

Four external interrupts and three internal interrupts are provided on the CP 1621B control chip along with seven system control lines. All operations of the MCP 1600 microprocessor system are under the direct control of this chip.

The basic MCP 1600 three-chip microprocessor set is priced at $159 in 100 to 999 quantities. The microcontroller board is $672; the writable control store is $480; the programmable read-only memory store board is $192; and the interface board is $144, the firm said from 3128 Red Hill Ave., 92663.

Meet the new
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Police Check Traffic Violators' Vehicles in Seconds

STOCKTON, Calif. – If you get stopped for a traffic violation in San Joaquin County, Calif., you may have to pay a fine, but at least you won't have an embarrassing 15-minute wait by the roadside while the arresting officer radios in for "wants and warrants" on you and your car.

Thanks to a minicomputer-based communications system designed by PRC Public Management Services and the San Joaquin Sheriff's Department, a complete vehicle check can now be made in seconds.

In fact, before he even pulls you over, the deputy will probably already have requested and received the information that your car was neither stolen nor used in a recent crime.

The high-speed message-switching system links officers in 15 to 25 police cruisers to detectives and dispatchers at headquarters and allows them to access data in the Police Information Network (PIN), the San Joaquin County Univac computer, the various agencies with the California Law Enforcement Telecommunications System (Clets) and – through Clets – the FBI.

Sheriff's department officials estimated that there are approximately 5,350 data entries and inquiry/response transactions between the system and these data sources daily.

Video Receivers Faster

Current field tests have shown that mobile video receivers in police cars can provide even faster responses to inquiries than are possible via conventional radio. Furthermore, video display has the advantage of greater message security by effectively eliminating voice or hard-copy interception by unauthorized persons.

The computer can also hold up simultaneous messages and broadcast them serially to the cars for whom they are specifically intended.

At the center of the system are two Digital Equipment Corp. PDP 11/40 computers, disk drives, a tape drive and console teleprinter, as well as a linc printer and other necessary peripherals.

Video, Hard-Copy Terminals

The central system at police headquarters here supports both video and hard-copy terminals at police agencies throughout the county, and plans exist for extending the system into adjoining counties.

One of the major problems in systems dealing with sensitive material is security, especially when those systems are designed – as is San Joaquin's – to be operated quickly by means of prompting information and standard video masks (programmed forms with blanks to be filled in) by persons with no special computer training.

The problem has been handled by allowing only selected terminals access to certain types of restricted information. All other terminals are locked out by coded programs.

Unattended terminals are automatically shut off from the system and – when required by emergencies or schedule changes – terminals can be turned off or on from the central control console in the computer room.

Should a security violation occur at an unauthorized terminal, the incident is automatically logged with the time of day and the terminal identity.

Further, if the security "key" of the inquiring terminal does not compare with the "lock" of the requested transaction, an alarm message is printed on the control console.

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The same company . . . Texas Instruments . . . makes every member of the family, and makes every member software compatible, from the bottom up. The new Model 990/4 microcomputer and Model 990/10 minicomputer use the instruction set of the TMS 9900 microprocessor. This means that software developed for the low-end computers will be compatible with the higher performance models. And, users can expand their systems with a minimum of interface and software adaptation.

The TMS 9900 Microprocessor

The TMS 9900 is a 16-bit, single-chip microprocessor using MOS N-channel silicon-gate technology. Its unique architecture permits data manipulation not easily achievable in earlier devices. With its repertoire of versatile instructions and high-speed interrupt capability, the TMS 9900 microprocessor provides computing power expected from a 16-bit TTL computer.

The Model 990/4 Microcomputer

It's a complete computer on a single printed circuit board using the TMS 9900 as its central processor. The 990/4 is ideally suited for terminal control, peripheral device interface control, and as a CPU for OEM customers.

In addition to the TMS 9900 microprocessor, the 990/4 microcomputer contains up to 8K bytes of dynamic RAM, up to 2K bytes of static RAM and/or PROM, eight vectored interrupts, front panel interface, real-time clock input, two I/O buses for low- and high-speed devices, and optional ROM utilities.

With the 990/4, you can select a low-cost OEM package, a 7-inch or 12¼-inch rack-mountable chassis, or a table-top enclosure . . . and memory expansion to 58K bytes.

Price: The Model 990/4 microcomputer with 512 bytes of memory is only $368* without chassis and power supply. This same model with 8K bytes of memory is only $512*.



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The most powerful member of the family is the Model 990/10 general-purpose minicomputer. The 990/10, a TTL implementation of the 990 architecture, provides the high-performance speeds demanded in many applications.

A memory mapping feature providing memory protection and privileged instructions supports memory expansion to two million bytes. And TILINE**, an asynchronous high-speed I/O bus, supports both high-speed and low-speed devices. Chassis options are the same as those for the 990/4.

Price: With 16K bytes of memory, chassis, power supply and programmer's panel, the Model 990/10 minicomputer is only $1968*.

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High School Upgrades System With Addition Of Floppy Package

SUNNYVALE, Calif. – A small high school, which four years ago was one of the first in Northern California to install an educational computer, recently upgraded its system with the addition of a floppy disk memory package.

Oroville High School purchased an Advanced Electronics Design (AED) 3100P subsystem to add up to 1 million bytes of data storage to its Nova computer. Students and instructors access the system through any of the five teletypewriters or two CRT units.

A floppy disk system contains all electronics and four drives in a single cabinet. A programmable formatter permits each drive to read or write in different formats.

It is possible, for example, for one drive to contain the minicomputer operating system written in 256-word sectors while other drives process IBM-compatible 64-word sectors.

The high school installed its first computer in 1971. Since then they have operated entirely from punched tape stored at a central location.

Can Expand Library

With the addition of the floppy disk subsystem, its instructional library can be greatly expanded. Likewise, the size and simplicity of the diskettes that hold the data will allow departments, teachers or even students to maintain their own files.

A high percentage of the school's 1,200 students are now involved with the computer. In addition to teaching computer science itself, the facility is used for instruction in mathematics, science, English, social science music and art.

Even the physical education department is using the computer's statistical capability for analyzing sporting events.

With the memory storage unit, it will now be possible to carry out programs involving volumes of data that were not possible before. For example, the sociology department might want to manipulate large stores of facts on population behavior patterns. This would have been impractical using paper tape.

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We've selected leading experts from around the country to guide each of our Seminars. They are highly accomplished specialists in their fields, experienced in presenting their techniques to industry and management.

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Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

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New York	**Essex House**	**Jan. 26-27**
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New York		**Jan. 26-27**

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Wema Panel Assesses Peripherals Market Strategies

By Toni Wiseman
Of the CW Staff

MONTEREY, Calif. – In most areas of the peripherals business, the key to success is to "take a bead on the market you want, concentrate and go for it," Pertec President Ryal R. Poppa said here recently.

Although IBM lately has been segmenting products into smaller market areas, peripherals companies can succeed by taking aim, he said.

Sycor, Inc. President Sam Irwin said that being a specialized company has advantages.

"If a company is going to remain competitive, it will require the shortest possible reaction time for everything from marketing to planning, including service and training. Only small companies can be responsive in such a dynamic situation," he said during a panel discussion called "Computer Peripherals: How Serious is the New Competition?" at the Western Electronics Manufacturing Association (Wema) annual conference here.

In the current environment within intelligent terminals, "new applications are demanded and devised rapidly, many times more rapidly than we as manufacturers can accommodate and certainly more rapidly than our larger contemporaries can react to them," Irwin said.

As an example, he said that IBM documents uncovered in the Telex case showed IBM instituted a crash program to combat Viatron Computer Systems Corp.'s offering. Four years later, he observed, the 3740 arrived.

Poppa called the terminal market "the closest thing we have to a free market in the computer industry. It's relatively cheap to enter, but it's a very large market . . . However, the entry cost of marketing is often underestimated and the entry cost of software is always vastly underestimated," he said.

Poppa said he sees no logical way in which IBM can effectively curtail or stop the independents in this market. "The 3740s, 70s and 90s have not done the job IBM had hoped," he said.

"At Pertec, we've concluded there has really not been a step-up in technology that has resulted in the replacement of installed units," he said.

"Rather there has been a proliferation down many paths ending up in different segments of the marketplace, which serves to effectively segment the market into smaller compartments than previously existed."

This, he noted, is a healthy strategy for IBM since it narrows the target competitors can shoot at. In the disk drive area, for instance, the compartments are defined by capacity, in part by price and in part by formatting, and IBM has attempted to relate capacity more to the CPU demand than it ever has in the past.

"As a result, the 3330, 3332, 40 and 50 are ending up in different market segments," thus shrinking the targets for competitors, who are forced to sharpen their aim for a larger percentage of the market, he said.

Alternatively, the competitor has got to "proliferate himself, go down some of these other avenues and attack other markets. And that costs a lot of money. Most of us who might attack that market don't have those kind of dollars to work with."

Pertec is using proven cost-effective technology; "that means last year's IBM technology," he said. "We do that consciously because we don't want nor can we afford to spend leading-edge development dollars. Instead, we wait to be sure it works and is accepted and then try to offer something more cost-effective."

Evolutionary History

Jesse Aweida, president of Storage Technology Corp., said the history of large or high-performance peripheral systems has been more evolutionary than revolutionary, reflecting more capability, lower cost and greater reliability.

When a device comes along which is revolutionary in nature, and therefore requires a good deal of conversion, people don't jump to it.

Users want more throughput or I/O or whatever the new product offers, he said, but they want to be able to use it under their current operating system.

When IBM offers a new product, it slows down sales for independents, Aweida said, because the users tend to stop and evaluate the market, waiting to see how the new product works before they either order it or continue with the gear they had originally planned, Aweida

(Continued on Page 30)

Tougher Antitrust Laws Needed

Court Should Take Consumer's View: CIA

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – Courts should consider the supply-substitutability issue in antitrust cases from the view of the consumer rather than the supplier, Computer Industry Association (CIA) President A.G.W. (Jack) Biddle testified at a House of Representatives subcommittee hearing here.

In presenting amendments to the Predatory Practices Act of 1975 proposed by the Justice Department, Biddle explained the CIA is attempting to include "not only predatory practices which many of our members have suffered over years of competing in a single-firm-dominated industry, but also those with which we have become familiar through three intense years of litigation watching."

The underlying issue in the Telex vs. IBM case was relevant market, and the reason for the difference in the decisions by the District Court and the Court of Appeals was that the District Court viewed the market from the consumer's perspective while the other took the seller's view, Biddle told the Small Business Committee's ad-hoc subcommittee on antitrust, the Robinson-Patman Act and related matters.

"Although developed in the record, it is clear that the Appeals Court failed to grasp the realities of the marketplace and consider the actual choices available to consumers, as against the theoretical possibility of supply substitutability on the seller side," he said.

In proposing the Predatory Practices Act, the Justice Department is considering either replacing the existing Robinson-Patman Act or combining the two, one observer said.

The CIA would include in the Predatory Practices Act of 1975 language that forbids a company from making threats against creditors and shareholders of a competitor as well as direct threats against the competitor.

"Threats made indirectly through a competitor's creditors or majority shareholders can have the same anticompetitive consequences as those made to the seller, since they go directly to the source of the seller's authority and financial power," Biddle said.

Leased Equipment Included

The CIA would include leased equipment in the section dealing with unreasonably low prices.

Biddle proposed legislation that would forbid further use of IBM's tactic of repackaging an existing product, lowering the rental price below that charged for other similar IBM devices and offering this product to those customers who were considering the lease of a competitive product.

The clause reads it shall be unlawful "to sell or lease replacement or add-on commodities or services to the seller's existing customers on a discriminatory basis where the discrimination systematically favors customers for which the seller faces actual competition."

As included in Biddle's definition of terms, "replacement or add-on commodities" is meant to include "those commodities which enhance the performance or function of the commodity or service previously sold or leased to the consumer as recognized by consumers of that commodity."

Although the Predatory Practices Act would permit new entrants to charge lower prices in some instances, the CIA would prohibit a firm which is repackaging a product through bundling technology, integrating components and subsystems from being classified as a new entrant.

The Predatory Practices Act reaches practices not included in the Robinson Patman Act, an observer said. Justice seems to be trying to outlaw certain practices by the Predatory Practices Act without requiring proof of such a high level of anticompetitive restraint as does the Sherman Act, he added.

In making his presentation, Biddle told

(Continued on Page 30)

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Peripherals Mart Strategies Assessed by Wema Panel

(Continued from Page 29)

said.

"The only way you can keep sales up during a period like this is if you have demonstrated to the customer that you have the technology, that you can compete, that you have built up credibility in the past and that you can come up in a timely fashion with devices which can compete with what IBM has just offered," he said.

Another point to consider, Aweida added, is that there has yet to be a product announcement claiming maximum capability, so anytime a company is designing seomthing new, it has to plan for that "midlife kicker" which will give the user an improvement or more for less.

Bob Howard, president of Centronics Data Computer Corp., said it is healthy for the industry to direct itself to the competitive moves of the larger companies; otherwise, the industry becomes sluggish.

The threats to small companies from large ones come in several categories, Howard said. The large companies, for instance, become suppliers of the total system, including all peripherals.

"They are also now offering total system integration which really could disguise price cuts on subsystems, peripherals and components which makes price comparisons extremely difficult," he said.

In addition, the interdependency of devices makes plug compatibility very difficult and, in some cases, impossible for small companies, he noted.

Problems Raising Capital

"The small companies, because they specialize, sell either software or hardware, not total systems," Howard said. "They have a far greater problem with raising of capital, they have to control demands for business expansions, have to keep up with technological improvements and with customers becoming more and more demanding."

But the big problems for small companies, he said, is the lack of de-facto standards in the industry. The large companies such as IBM make their own standards for their own economic purposes, and the little guys have to follow along.

On the more positive side, however, the opportunities for small companies are great, Howard said. Users are becoming more sophisticated and buy what they need, not what the vendor tells them to buy. The concept of multiple vendors is a definite asset in the competitive market.

Unlike a large company, the small company can satisfy the unique features required by the user in his system configuration, he said.

Antitrust Court Should Take Consumer's View, CIA Says

(Continued from Page 29)

the subcommittee "our original antitrust laws were too vague in their intent to restrain today's giant corporation.

"The development of the multiproduct line/multiindustry corporation has effectively moved most of the giant corporations beyond the reach of existing law and established legal precedent," he remarked.

Markets Redefined

Because of the lack of hard data on the size and structure of a number of the major sectors of our overall economy, attorneys defending corporations accused of antitrust violations "can and do define and redefine the relevant market to suit the situation – and they get away with it time after time."

Using the supply substitutability criteria of existing case laws, monopoly firms can contend that any other giant corporation could, if it wished, enter its market and compete.

"One of the weaknesses of the Robinson-Patman Act is that it assumes companies are relatively equal in the beginning, when in fact they are not," Biddle said.

As examples, he cited actions by AT&T and IBM to cut prices on certain products and compensate in other product areas.

AT&T "virtually destroyed the fledgling specialized common carrier industry by lowering prices where it faced competition from the new entrants and offsetting the loss by raising prices where its monopoly services are immune from attack," he said.

IBM acted similarly when it lowered the cost of memory and raised the price of the central processor. IBM was still able to show a profit on the price of the memory, he observed.

Big Firms Use Loopholes

The Robinson-Patman Act "cannot effectively deal with the monopolist who can, with impunity, lower prices below the previous monopoly level – but not below 'costs' – drive out the smaller competitors and then return to monopoly price levels," Biddle said.

"Also, today's multiproduct/market giants can circumvent the intent of the antitrust laws by hiding their anticompetitive strategies and predatory practices behind the guise of technological necessity" – such as IBM's moving the controller into the CPU, he said.

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Edited by Drake Lundell, this special issue will review all the big stories in the 1975 computer world · from developments in hardware, software and communications to changes in computer law and the impact of computers on society. It'll be an excellent overview of what's happened, combined with some knowledgable forecasts of what's going to happen in 1976. And if you have anything to do with computers, you should be there on December 31st.

If you're a DP marketer, remember the closing date for this special issue: December 12th. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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U.S. vs. IBM Trial Reports Available on Infonet Net

WALTHAM, Mass. – International Data Corp.'s (IDC) reporting service on the U.S. vs. IBM antitrust trial is available through the Infonet network.

The new communications arrangement will allow longer, more detailed reports of testimony, motions and documents, according to William Leitch, IDC vice-president.

Subscribers can also access reports filed within the last month and will have access to other trial-related data bases now under construction, he said.

Subscribers to the daily service can access the network via terminals in their offices. Prices of the service is $60/week. IDC is at P.O. Box 915, 02154.

DP Groups Name New Officers

'Tis the season for association elections and appointments, and a raft of them have come in, with a new president at the Association of Data Processing Service Organizations (Adapso) and chairman at Computer Business Equipment Manufacturers Association (Cbema).

Weisburgh Leads Adapso Slate

MONTVALE, N.J. – Adapso has a new slate of officers to lead it through 1976, headed by President Leon Weisburgh, president of Anstat, Inc. of New York.

Weisburgh will be assisted by Louis Pfeiffer, Data Systems Division, A.O. Smith Corp., as first vice-president and Edward Horst, Comtech, as second vice-president.

Adapso's Data Center Section has elected Jack Williams president. Williams is president of Unitab Co. Serving as vice-president is Roland Smith, president of Computer Services Corp.

The Remote Processing Services Section of Adapso named Curt DeForest as president and John Skodon as vice-president.

The Software Industry Association re-elected Lloyd Baldwin president. Baldwin is president of Lloyd Baldwin & Associates. Bruce Coleman, president of Boole & Babbage, Inc., is vice-president.

Tabat Presides at Cbema

WASHINGTON, D.C. – Cbema's new chairman of lhe board is E. Lawrence Tabat, president of Dictaphone Corp.

Tabat succeeded Gerald G. Probst, president of Univac.

Maurice A. Longsworth, director of licensing and export at Honeywell Information Systems, is chairman of Cbema's Data Processing Group.

CLA Names Technical Head

WASHINGTON, D.C. – The Computer Lessors Association (CIA) has named Orville A. Wiseman chairman of its technical committee, which is responsible for implementing national programs for enhancing systems owned by CLA members.

IBM Seen Meeting 1975 Goals

EAST FISHKILL, N.Y. – IBM's operating divisions should "meet their objectlves" by year-end or "come close to them," Chairman Frank T. Cary told security analysts here recently.

Despite increased costs and other factors that have put pressure on profit margins, overall "we feel our business is improving," Cary said.

Backlog for DP equipment is about the same as at the end of 1974, he said. Although shipments and installations of equipment are lower than a year ago, they continue at a high level, he added.

Outright sales of DP products have steadily increased during 1975, although they are still below the 1974 level, according to B.H. Witham, treasurer.

This is partly attributable to an increase in purchases by users who had been renting the equipment, he said.

Cary called the computer industry "still very young and dynamic" and said it would remain a growth industry – along with word processing – for a "long time to come."

Much of that growth will come from small firms that are not users now, he said. "There appear to be no limits to how far we can push technology or to new applications of our products," Cary added.

Witham indicated IBM's profit margin for the first nine months was 22.8% compared with 24.4% for all of 1974. However, he added, each quarter has been improving, with the third-quarter rate reaching 23.6%.

In the present recession, Cary observed, users have not been returning rented computers as they did in the 1970-71 time frame.

Two Service Firms Expanding Overseas

Interactive Data Corp. and Automatic Data Processing, Inc. (ADP) are continuing the trend toward overseas expansion among service firms.

Interactive Data has opened its first overseas facility in London, which it said will provide all of the firm's products now available in the U.S., including support and use of data bases maintained in Waltham, Mass.

Similar operations are planned for other European countries, according to Jack A. Arnow, president.

ADP Buying Delos

ADP has agreed in principle to acquire The Delos International Group, Inc. for about $7.3 million.

The agreement is contingent upon the signing of a definitive contract and the approval of ADP directors and Delos stockholders.

Delos is a time-sharing firm with offices in the UK and Brussels.

ADP President Frank R. Lautenberg said Delos activities will be integrated with ADP's Cyphernetics Division, which has offices abroad in London and Brussels. Earlier this year, Delos bought the time-sharing business of Applied Data Research, Inc. [CW, May 21] and ADP bought Cyphernetics [CW, Aug. 27].

IBM Files Against Xerox For Patent Infringements

ARMONK, N.Y. – In a turnaround, IBM has filed patent infringement suits against Xerox Corp. charging it with infringing upon its U.S. and Canadian copier patents.

The patent battle between the two firms has existed since April 1970, when Xerox filed against IBM.

The IBM suit asks for injunctions against Xerox and for unspecified damages.

The patents relate to a process which improves the quality of copies and extends the useful life of the photoconductive surface in copiers. IBM said two Xerox copiers use this process.

Tymshare to Acquire Autex

CUPERTINO, Calif. – Tymshare, Inc. has agreed in principle to acquire Autex, Inc., which operates a securities information system principally used by broker/dealers and financial institutions.

The agreement, subject to completion of a definitive agreement and approval by Autex shareholders, calls for an exchange of stock.



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ADR Urges Patenting of Software as Machine System

WASHINGTON, D.C. – Applied Data Research, Inc. (ADR) has filed a "friend-of-the-court" brief with the U.S. Supreme Court here supporting patenting of software.

ADR argued software is indeed a machine system rather than an idea or a method of doing business.

ADR, which has received patents on some of its software, argued the hardware manufacturers seek to protect their own domains by opposing the patentability of software, as expressed in the brief filed by the Computer and Business Equipment Manufacturers Association (Cbema).

The hardware manufacturers, the ADR brief continued, "have obtained patents for their hardware programming developments; these are the products they price in the bundle of hardware and software they sell.

"However, the hardware manufacturers do not wish to be restrained in any way by software patents companies such as ADR may obtain; for such patents would enable small software companies . . . to enter into competition with the hardware manufacturers even as against the 'free' software," ADR said.

"The hardware manufacturers, which have substantial monopoly positions in the software they supply with their hardware, seek a registration system for protection of the noninnovative features of their software and would deny to innovative competitors the incentive that is the basic rationale of the patent system," the ADR brief stated.

"Besides stimulating innovation, patent protection will enable other small software companies to compete with the hardware giants, as it did amicus ADR. It will end the reliance on trade secrets as the only means to protect innovative software, which has had the effect of inhibiting the free flow of information," ADR continued.

The brief attacked the suggestions by those opposed to the patentability of software that adequate protection could be granted by copyright.

"A registration system (whether copyright or otherwise) is intended to protect noninnovative features of the machine system embodied in the detailed coded instructions of the software.

"Such protection is clearly proscribed by the constitution," the brief said.

"Furthermore, that proposal would have the constitutionally innovative features pass into the public domain. Therefore, the constitutional policy of providing an incentive to "innovation" would not be served by the Cbema proposals; it would be circumvented," ADR said.

The upcoming case before the Supreme Court of C. Marshall Dann vs. Thomas R. Johnston has elicited amicus curiae, or "friend of the court," briefs from industry associations as well as private firms.

Summaries are given here of Applied Data Research, Inc.'s brief supporting the patentability of software and the Computer Business Equipment Manufacturers Association's position against software patentability.

ADR also observed the Court of Customs and Patent Appeals' findings in prior cases apply here; specifically, software structures general-purpose hardware into a special-purpose computer, the structure of which is then different from the general-purpose machine.

The brief pointed out that, in the case of patents granted to ADR for software, "it is clear that not only is there a machine system distinctly different from a human 'mental process,' but that any patents on these systems would not cover mathematics or prevent the human performance of any 'mental process' or 'method of doing business.'"

Program Only a 'Way of Doing Business': Cbema

WASHINGTON, D.C. – Thomas R. Johnston's software program should not be patented because it is based on an algorithm that is essentially "a method of doing business," according to the amicus curiae brief filed with the Supreme Court by the Computer Business Equipment Manufacturers Association (Cbema).

The brief was filed on the case of C. Marshall Dann vs. Thomas R. Johnston.

Johnston's concept of coding, which is intended for use by banks, is not patentable and does not become so because a general-purpose computer is programmed to perform the "nonpatentable subject matter," the Cbema filing contended.

The filing disagreed with Johnston's position that a general-purpose computer, when programmed with a financial accounting procedure, becomes a machine system and is therefore patentable.

Even if Johnston "had disclosed a hardware implementation for his nonpatentable algorithm," Cbema said, "it should not be patentable if claimed so broadly as to provide patent protection for the algorithm," the brief said.

"Thus, where a computer program is predicated upon a nonpatentable algorithm, the program should not be patentable as a 'machine system' even if it coacts 'synergistically' with the computer," Cbema said.

In this case, however, the court doesn't have to address the issue of synergism since "none exists. The computer is simply being used as a tool to perform the financial banking algorithm developed by respondent," the brief said.

The determination of an invention's patentability must be made by examining the substance of the discovery rather than the form in which it is claimed, the brief held.

The association contended the software industry has shown tremendous growth within the past two years and patents are not needed to promote further growth in the industry. Rather, it is the general absence of patents that has aided the recent growth, the hardware group claimed.

Programming breakthroughs in the last two decades "have by and large taken place in a legal framework conducive to the free interchange of ideas and information . . . This atmosphere of intellectual freedom has contributed significantly to the enormous strides made in the use of computers," Cbema said.

Hardships to Users

Granting patent protection to the originators of algorithms would impose hardships on the user community, since users would have to ensure programs they develop do not infringe any patents, the group said.

The brief further contended copyright laws provide a viable form of protection for marketing computer programs.

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Vendor Climbs Back From Receivership

By Patrick Ward
Of the CW Staff

DON MILLS, Ont. – Consolidated Computer, Inc. (CCI) is probably one of the few firms in the industry that has ever made the climb back from receivership, according to William G. Hutchison, president of the Canadian key-to-disk vendor.

But then, U.S. companies don't have the Canadian government for a godfather.

CCI demonstrated a working key-to-disk system in June 1969, making it one of the first companies to show this type of equipment, Hutchison recalled.

The company launched marketing and field service operations in the U.S. and Canada. English and German subsidiaries followed, as did an OEM contract with International Computers Ltd. (ICL).

"We were right up there with Computer Machinery Corp. and Inforex" at that time, Hutchison said.

Trouble Ahead

But even as sales climbed, trouble loomed.

"We tried to do a stock offering in the U.S. at the end of 1971, but the time was unfavorable," Hutchison said

At about the same time, the company's financial backers lost confidence in the company's president/founder, he said.

By the fall of 1971, CCI couldn't raise sufficient equity to support its increasing debt and went into receivership.

As CCI begin to make the climb back up, the Canadian government guaranteed a lease-financing loan from Ford Motor Credit. The government made good on Ford's claims, Hutchison said, but took over CCI's lease base and sold it back to CCI in exchange for debentures.

The federal and provincial governments also put new operating capital into the company. The debt settlement and new capital made them 52% owners of CCI's stock.

CCI emerged from reorganization and receivership in March 1972. It had sold off both its English and German subsidiaries, but had kept its customer base in North America.

The company also "had not laid off one person in the product development area from the time it went into receivership," Hutchison said.

Lacking the capital for lease financing, CCI came back exclusively as an OEM. ICL soon helped CCI back on its feet with a $7 million order for Key-Edit systems.

The British firm placed another $20 million order in the fall of 1972. Other OEM contracts came from Japan's Fujitsu and Echodata, the Brazilian subsidiary of Britain's Cable and Wireless Ltd.

In mid-1974, the Canadian government agreed to support CCI in its move back into the North American end-user market.

"The government wants to see us grow because it feels Canada can play a role in communications, in data entry front ends or distributed processing and in applications software," Hutchison said.

CCI is the largest native Canadian manufacturer of DP equipment and makes its own mini- and microcomputers, CRTs and keyboards, he said.

CCI first operated under direct government loans to support its leases, but the company is now shopping around for loans from other sources. These would still be 90% government-guaranteed, Hutchison noted.

A year after resuming direct marketing to the U.S. and Canadian customers, business is good for CCI, he said. The company expects $5 million in U.S. sales during 1975 and $8 million in 1976.

About 700 of the 1,000 Key-Edit systems the company has shipped went overseas. "We have about 25% of the key-to-disk business in England, about 65% in Canada and about 4% in the U.S.," he said. The firm's products are used in 28 countries.

Also on the international front, Hutchison said CCI might market Fujitsu terminal products in North America.

Capac Offering Systems Houses Technical Help

RIDGEFIELD, Conn. – Capac, Inc. is offering small minicomputer systems and software houses technical assistance which is normally not available from OEMs when equipment is purchased at discounted prices, the vendor said.

When small systems and software houses purchase minicomputers from OEMs, they are confronted with several problems, said Capac President David H. Brown.

"The smaller houses do not normally have the technical expertise to perform the functions of software support, installation, quality control and field servicing that are necessary to satisfy the end user," he said.

"Therefore, it becomes a question of whether they should give up the discount when buying equipment, in order to get technical assistance from the manufacturer, or to pay up to $35 an hour for servicing," Brown said.

Capac has itsyn in-house expertise for hardware and software and can support end users served by other systems houses, he said. This enables others to take full advantage of manufacturers' discounts, he added.

Capac develops and markets minicomputer systems for business applications.

Singer Division Reorganizes

NEW YORK – George R. Cogar, president of the Singer Co.'s Business Machines Division, has completed the reorganizational lineup of the division's top management team. Several officers were formerly executives with the Cogar Corp. subsidiary.

With these appointments, Cogar said, the division is ready to carry out its strategy of consolidating and concentrating its resources and marketing efforts on the growing retail and terminal systems markets.

J.J. Ryan has been appointed senior vice-president of North American marketing, replacing R.W. Casey, former vice-president of domestic marketing. Maynard Smith, who was appointed vice-president of service support, replaces Ryan. Smith had been director of field engineering.

Larry F. Neely was named vice-president of operations for the Albuquerque, N.M., and San Leandro, Calif., operations, replacing R.E. Ward, who is being reassigned. Neely had been vice-president operations for Cogar Corp.

All will report to Cogar except Smith, who will continue to report to Ryan.

In the marketing organization, John Kerin was appointed vice-president of marketing, retail systems, and Henry Donaldson vice-president of marketing, terminal systems. Donaldson was formerly director of markcting for Cogar.

Executive Corner

■ Kenneth J. Whalen has resigned as a director of Burroughs Corp.

■ Control Data Corp. has named Paul G. Miller president of its subsidiary, Commercial Credit Co. Vernon E. Sieling succeeds Miller as executive vice-president of marketing at CDC. Dr. Leroy F. Stutzman and Joseph M. Walsh have been named to CDC's board of directors.

■ Berthold Salz has been appointed vice-president of finance at Computer Transceiver Systems, Inc.

■ James L. Maddox has been appointed vice-president of planning at Computer Consoles, Inc.

■ Stephen Kaplan has been named vice-president of marketing at Computer Operations, Inc.

■ Kenneth B. Fannin has been appointed president of Ball Computer Products, Inc.

■ D. Michael Grimes has been named vice-president of marketing at Identicon Corp.

■ Ted Goodlander and Warren Hayes have been appointed vice-presidents of Wang Laboratories, Inc.'s International Sales Division and Manufacturing Division respectively; Robert Kolk and Harry Rothman have been named vice-presidents of Wang's Development Center Group.

■ Marvin C. Moses has been appointed vice-president of finance at Telenct Communications Corp..

■ Don Nielson has been named vice-president of field service and logistics support of Telos Computing, Inc.

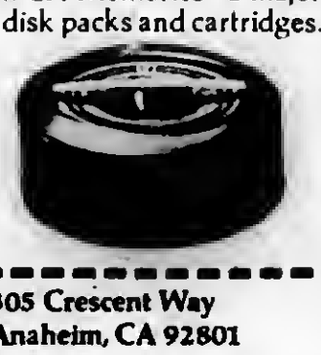
■ Robert P. Wolk has been named executive vice-president of Atlantic Software, Inc.

■ William G. Moore Jr. has been appointed vice-president of Inforex, Inc.



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For Vendor's Own Systems

Boise HP Primed to Make Peripherals

By Molly Upton
Of the CW Staff

NEWTON, Mass. – The prime mission of Hewlett-Packerd Co.'s (HP) Boise (Idaho) Division is to provide peripherals that will enhance the sale of HP systems. A very close second is to successfully compete in the OEM market, Bill Murphy, marketing manager, said here recently.

When HP moved to Boise, it found unexpected engineering talent in the area. Many of these people were employed in other industries, such as lumber or cement factories because they wanted to live in Idaho but could not find an electronics firm to work for, he said.

In addition, HP has established several training programs to give people the skills necessary for hiring, he said.

Currently the division makes tape drives handling 1/2-in. tape, the 7970 series, and has a manufacturing license for the Tally Corp. 200 line/min printer.

The division has its own research and development unit, which has led sources to suspect HP will come out with a new printer product, but Murphy was silent on that prospect.

Any future products developed by HP will be oriented toward both the HP and OEM market, Murphy said. HP now OEMs its tape drives, but its Tally license is only for use with HP systems.

There are ways in which the electronics for printing can be improved, he observed. For instance, using a combination of microcomputers and the dot matrix could give a really flexible machine, he said.

For use with HP systems, printers in the range of 200 to 400 line/min are popular, he said.

HP also provides other printers with its systems, such as Dataproducts printers, the GE Terminet and teletypewriters, he said.

Employment Growth

HP Boise currently has about 340 employees, of whom about 62 were transferred from other HP locations, so the division represents real employment growth rather than a transfer of personnel, Murphy said.

Boise was receptive to HP moving in, he said, and the firm has tried to hire as many people as possible locally.

"We found a lot of electronics technicians who were in the area just because they wanted to live in Idaho," he said.

But there was no skilled labor pool in elcctronics assembly, he said, so HP rented classroom space and set up a training program in basic electronic procedures such as wiring and soldering. In addition, it is working with Boise State University and a junior college to institute technical training programs.

In-house training is offered, including a videotape course from Stanford Universlty for graduate-level engineers. Complemented by HP tutors, the program includes tests that are mailed to Stanford to be graded. HP pays tuition for students.

Offering the opportunity to attain advanced degrees is important for recruiting engineers, Murphy said.

Univac Selects WUIS to Provide Equipment for Educational Facility

MINNEAPOLIS – Univac has selected Western Union Information Systems (WUIS) to provide two C-2100 front-end communications multiplexers and special switching equipment for use in the facility it is developing for the Minnesota Educational Computer Consortium.

Equipment under the contract to WUIS, valued at $250,000, is being delivered and the Minneapolis facility is scheduled to be operative next spring.

The C-2100s will connect a Univac 1100 with 300 communications lines linked to terminals throughout the state.

Other Awards

Shugart Associates has received a contract from Compugraphic Corp. for SA901 diskette drives to be used in Compugraphic's typesetting system.

Identicon Corp. has been awarded a contract from the Library of Congress to supply Model 600 optical scanning equlpment for use in a book-processing aystem.

The Computer Services Division of R. Dixon Speas Associates has received software development contracts from Air New Zealand and Qantas Airways to develop intercontinental computer flight training systems and from Air Canada for a computer-based crew scheduling system.

C3, Inc. has been awarded a $12 million contract by the U.S. Navy for 100 minicomputer systems to be used in business and scientlfic epplicatlons.

Teledyne Inet has received a contract from the Social Security Administration for a 400 Hz static uninterruptible power supply system, maintenance and spare parts.

Envirodyne's Olson Laboratorles has been awarded a contract by the Environmental Protection Agency to develop exhaust emissions data from 127 late-model "light-duty vehicles."

C3, Inc. has received two contracts from the National Aeronautics and Space Adminlstration to provide 11 minicomputer systems, support and installation training.

Orders & Installations

Total Systems, Inc., a DP firm, has ordered Model 2001 savings bank teller terminals from Bunker Ramo Corp.'s Information Systems Division.

Allis-Chelmers Corp. Electronics Operation will install a process control system at Martin Marletta Aluminum, Inc.

Atlas Industrial Co. has ordered a Hewlett-Packard 3000CX mini.

Goldworm, Inc. has ordered an interective, on-line turnkey Micos minicomputer system from Mini-Computer Systems, Inc.

Sperry Systems Management has ordered two Slash 4 systems from Harris Corp. for use in the navigational training portion of the Navy's Trident project.

The Georgia Institute of Technology has installed a Control Data Corp. Cyber 70 Model 74 computer system and will begin installing a CDC 6400 system to support a multipurpose campus-wide network.

Walter E. Heller & Co. has ordered a Burroughs B4700 system with dual central processors.

The Contra Coste Water District of Concord, Callf., has ordered a minl data center from Hewlett-Packard.

The U.S. Department of Commerce has ordered a Model 204 data base management system from the Computer Corp. of America for the Office of Minority Business Enterprise.

Fred S. James and Co. has installed Burroughs TC 3500 terminal computers in 20 of its 40 offices to establish e nationwide deta communications network.

Seattle First National Bank has ordered Incoterm's Series 7000 on-line banking system for use at 1,100 teller locations in the bank's 150 branches.

McDonnell Douglas Automation Co. hes ordered two Cyber 173 systems from Control Data Corp.

Lewis Business Forms, Inc. has ordered a Mead Dijit nonimpact printing system.

Expansions

California Computer Products, Inc. has leased 4,746 sq ft in Sequoia Commerce Center, Torrance, Calif., for use as district sales and service offices.

Tektronix, Inc. has relocated its Information Display Group to its 265-acre industrial park in Wilsonville, Ore., 18 miles south of Portland.

Pro-Log, a California-based manufacturer of microprocessor systems, has moved to new quarters at 2411 Garden Road, Monterey, Calif.

Singer-M&M Computer Industrles, Inc. is expanding its Orange, Calif., manufacturing facilities an additional 25,000 sq ft to meet increased production demand.

Interactive Deta Corp. has opened an office in the Foshay Tower at 821 Marquette Ave., Minneapolis.

Whitlow Computer Systems has moved its corporate offices to expanded facilities at 560 Sylvan Ave., Englewood Cliffs, N.J.

Contracts

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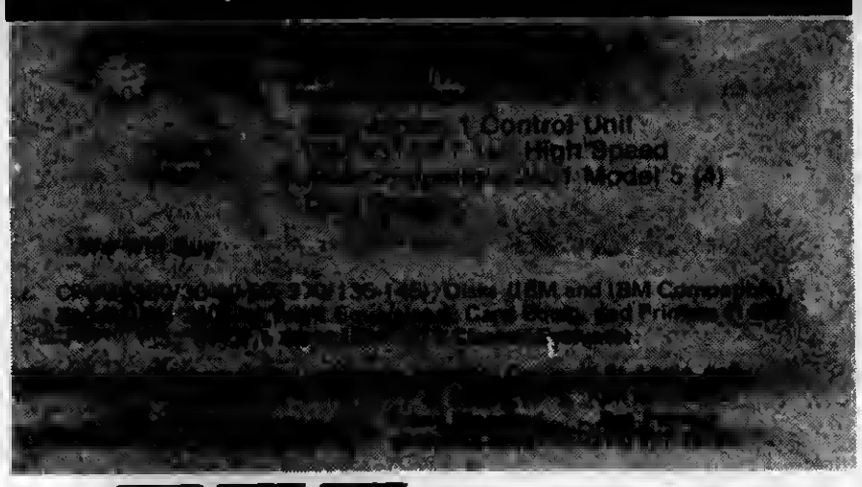
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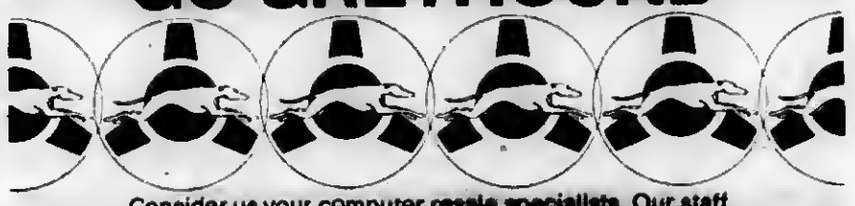
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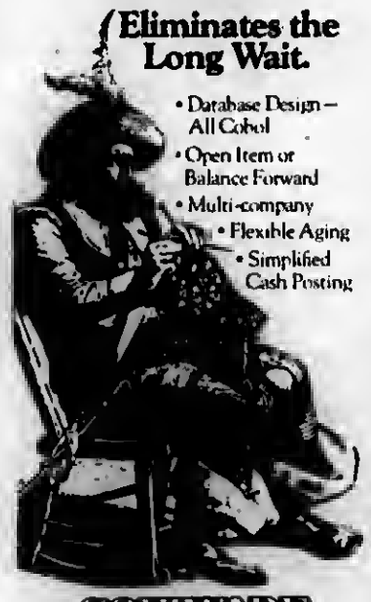
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Loss Tops $47 Million In Nine Months at Wyly

DALLAS – Wyly Corp. reported a nine-month loss of $47.9 million which it said resulted primarily from losses of $37 million from Gulf Insurance Co. and startup losses in Data Transmission Co. (Datran), its data communications service enterprise.

Datran has been achieving good sales of its data communications services in recent months and expects to reach an operating cash break-even point in the second half of 1976 and profitability in 1977, Wyly said.

Since its inception in 1968, Datran has required investment of $86 million in capital and startup expenses, Wyly said.

In the nine months, Wyly's $47.9 million loss compared with a loss of $5.6 million in the year-ago period, which was restated to reflect the sale of computer leasing operations, the Energy Division and Gulf, which is expected to be sold as of Dec. 31.

The 1974 period also was restated to report Datran losses during that period.

Revenues for the firm slipped to $46.8 million compared with $59.7 million in the year-ago period. Datran revenues rose to $926,000 compared with $557,000 in the same period last year.

But data communications services showed a loss before taxes and corporate costs of almost $8 million compared with a loss of $4.9 million in the year-ago period.

For the three months, Wyly posted a loss of $35.9 million compared with a loss of $3.2 million in the same 1974 period.

Revenues slipped to $15.8 million compared with $19.8 million.

The sale of Gulf will eliminate about $30 million of highest interest debt, leaving the firm with long-term debts with interest rates of 4% to 7.25%, Wyly said.

CSC Second-Quarter Earnings Rise

EL SEGUNDO, Calif. – Second-quarter earnings doubled and revenues increased sharply over the year-ago period at Computer Sciences Corp. (CSC).

Earnings for the 13 weeks ended Sept. 26 totaled $1.7 million or 12 cents a share compared with $856,000 or 6 cents a share in the same period last year.

Second-quarter revenues of $53.5 million were a record for any prior quarter and compared with $42.5 million in the year-ago period.

The earnings improvement resulted from continued gains in revenues and profitability from both sectors of the company's business, contract services and the operations of the Infonet time-sharing network, according to William R. Hoover, CSC chairman and president.

For the first half, earnings were $3.2 million or 23 cents a share, up 125% over the $1.4 million or 10 cents a share for the same period last year.

Revenues for the half rose to $103.9 million compared with $82.3 million a year ago.

NCSS Improves In Six Months

NORWALK, Conn. – Although National CSS, Inc.'s (NCSS) second-quarter earnings dipped, the results for the six months were an improvement over the year-ago figures.

For the quarter ended Aug. 31, the firm earned $481,700 or 45 cents a share compared with a restated $489,800 or 45 cents a share in the same period last year.

Quarterly revenue rose to $8.7 million compared with $8.4 million in the 1974 period.

The 1974 figures were restated to conform with a change effective in 1975 in accounting for software and system development costs, the firm said.

During the six months, earnings rose to $993,000 or 91 cents a share compared with $961,900 or 88 cents a share in the year-ago period.

Revenues for the half rose to $17.3 million compared with $16.7 million last year.

Acquisitions

NCR Corp. has acquired Learning Systems Development Corp., a Cincinnat-based company which specializes in the development of training material for the retail food industry.

Control Data Corp. has acquired 100% ownership of Medlab Computer Services, Inc.'s Medlab/Pathlab business. CDC previously owned 43% of Medlab's stock.

Itel Corp. has acquired Capital Business Services, Inc. for an undisclosed amount.

NLT Computer Services Corp. has acquired the Management Services for Automatic Data Processing, Inc. of Philadelphia in an exchange of 40,000 shares of NLT stock for all Management Services stock.

The 3M Co. has acquired the Graphic Systems Division of Gould, Inc.

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Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.24	$.22
Revenue	8,589,000	9,433,000
Earnings	208,000	192,000
6 Mo Shr	.47	.40
Revenue	16,362,000	17,608,000
Earnings	402,000	345,000

GRAHAM MAGNETICS
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.20	$.30
Revenue	3,728,361	3,925,696
Earnings	183,942	279,971

MACRODATA
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	.....	$.23
Revenue	$2,818,799	3,267,961
Earnings	(57,650)	229,970
9 Mo Shr	.05	.69
Revenue	8,704,779	9,526,294
Earnings	60,237	646,889

HARRIS
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.96	$.60
Revenue	118,660,000	107,129,000
Disc Op	.....	(1,319,000)
Earnings	5,851,000	3,721,000

INFOREX
Three Months Ended Sept. 26

	1975	1974
Shr Ernd	$.10	$.08
Revenue	13,734,000	13,129,000
Tax Cred	.....	53,000
Earnings	297,000	226,000
9 Mo Shr	.21	.06
Revenue	41,462,000	35,633,000
Tax Cred	58,000	53,000
Earnings	602,000	164,000

INFORMATION MAGNETICS
Three Months Ended Sept. 27

	1975	1974
Shr Ernd	$.32	$.04
Revenue	6,149,495	6,003,074
Tax Cred	198,833	.....
Earnings	420,571	52,913
9 Mo Shr	1.17	.32
Revenue	17,719,869	17,264,099
Tax Cred	705,559	.....
Earnings	1,493,159	407,660

ITEL
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.33	$.32
Revenue	58,200,000	35,500,000
Tax Cred	.....	a100,000
Earnings	2,700,000	2,800,000
9 Mo Shr	.76	.82
Revenue	139,100,000	104,500,000
Tax Cred	.....	a400,000
Earnings	6,500,000	7,300,000

a-From discontinued operations.

LITRONIX
Three Months Ended Sept. 28

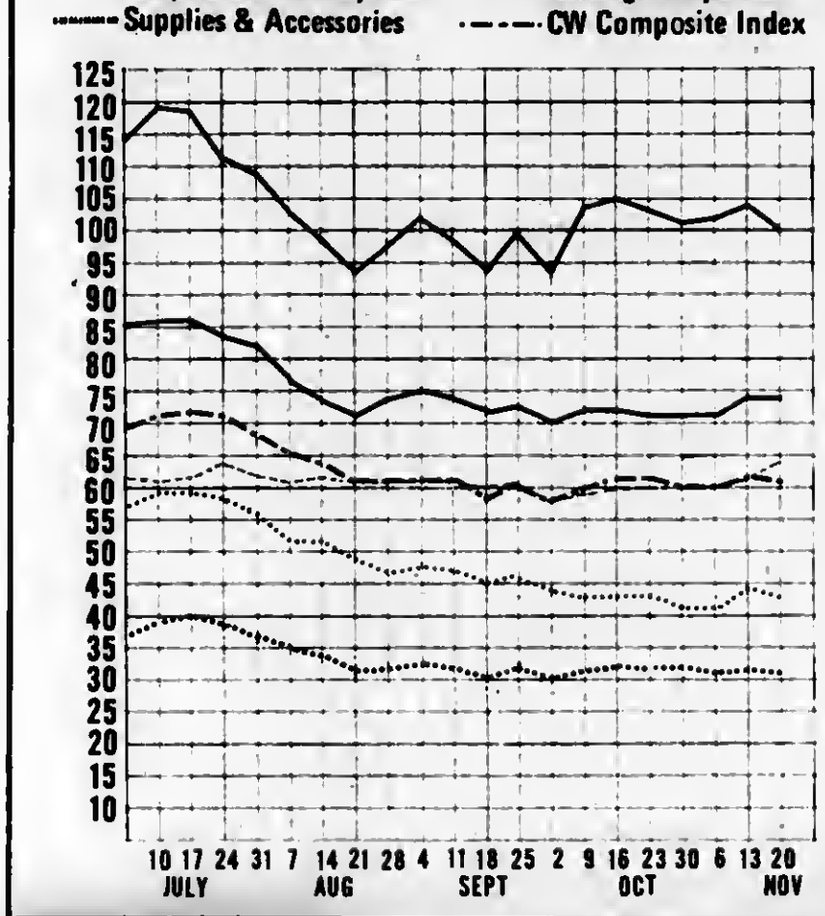
	1975	1974
Shr Ernd	$.12	$.12
Revenue	13,203,000	9,583,000
Tax Cred	.....	105,000
Earnings	294,000	306,000
9 Mo Shr	.29	.14
Revenue	36,866,000	25,029,000
Tax Cred	.....	105,000
Earnings	727,000	347,000

MICRODATA
Year Ended Aug. 31

	1975	a1974
Shr Ernd	$.71	$.41
Revenue	15,944,074	13,829,599
Tax Cred	501,000	265,000
Earnings	1,117,997	641,466
3 Mo Shr	.48	.....
Revenue	5,264,499	4,263,105
Spec Item	c367,000	b(75,500)
Earnings	753,647	(99,610)

a-Restated to reflect accounting change. b-Reversal of tax-loss carry-forward. c-Tax credit.

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CLOSING PRICES WEDNESDAY, NOVEMBER 19, 1975

All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE [1]	CLOSE NOV 19 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	81 5/8	+1 7/8	+2.3
O	COMPUTER AUTOMATION	2- 11	10 1/8	+ 1/8	+1.2
N	CONTROL DATA CORP	11- 23	19 1/4	- 1/8	-0.6
N	DATA GENERAL CORP	10- 39	36 1/2	-2 1/2	-6.4
O	DATAPOINT CORP	6- 26	23 3/4	-1 3/4	-6.8
O	DIGITAL COMP CONTROL	1- 4	1 1/2	- 3/4	-33.3
N	DIGITAL EQUIPMENT	46-140	130 1/4	-9 3/8	-6.7
N	ELECTRONIC ASSOC.	2- 3	2 1/2	0	0.0
A	ELECTRONIC ENGINEER.	5- 13	7 1/2	0	0.0
N	FOXBORO	23- 42	28 1/4	+ 1/4	+0.8
O	GENERAL AUTOMATION	4- 14	4 5/8	- 7/8	-15.9
O	GRI COMPUTER CORP	1- 1	1/2	- 1/8	-20.0
N	HEWLETT-PACKARD CO	58-120	95 5/8	-7 3/4	-7.4
N	HONEYWELL INC	22- 43	33 1/4	-2	-5.6
N	IBM	158-225	219 1/2	-5 1/4	-2.3
O	INTERDATA	1- 10	8 1/2	0	0.0
O	MICRODATA CORP	2- 4	7 3/8	+ 1/4	+3.5
O	MODULAR COMPUTER SYS	5- 19	11 3/4	+ 1/4	+2.1
N	NCR	15- 39	23 3/4	- 1/2	-2.0
O	PRIME COMPUTER INC	2- 6	4 1/4	- 1/2	-10.5
N	PERKIN-ELMER	16- 30	25 1/2	+ 1/2	+2.0
N	RAYTHEON CO	26- 56	46 1/4	-2 1/8	-4.3
N	SIGMA COMPANY	9- 17	9 3/4	- 1/4	-2.5
N	SPERRY RAND	26- 49	42 1/4	-1 3/4	-3.9
A	SYSTEMS ENG. LABS	1- 5	3 7/8	+ 7/8	+29.1
N	VARIAN ASSOCIATES	7- 19	17 3/4	-1	-7.2
N	WANG LABS.	7- 17	13 5/8	-1	-8.6
N	XEROX CORP	50- 86	50 5/8	-6	-10.5
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	3 3/8	0	0.0
A	COMMERCE GROUP CORP	2- 4	2 1/4	- 1/8	-5.2
A	COMPUTER INVSTRS GRP	1- 2	5/8	-	-9.1
N	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	0- 1	5/8	+ 1/4	+66.6
N	DPF INC	3- 6	4 1/2	+ 1/8	+2.8
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 5/8	0	0.0
N	ITEL	3- 9	6 1/4	- 1/8	-1.9
N	LEASCO CORP	4- 9	5 1/4	- 3/8	-6.6
O	LEASPAC CORP	1- 1	1/8	- 1/8	-50.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NPC INC	0- 4	3/8	- 1/8	-25.0
A	PIONEER TEX CORP	2- 7	5 3/8	+ 1/8	+2.3
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	1- 14	7 3/8	- 5/8	-7.8

EXCH		1975 RANGE [1]	CLOSE NOV 19 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	1 1/8	+ 1/8	+12.5
A	APPLIED DATA RES.	1- 10	2	+ 3/4	+60.0
N	AUTOMATIC DATA PROC	29- 65	59	- 1/4	-0.4
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
O	COMPUTER DIMENSIONS	2- 6	3 1/2	0	0.0
O	COMP ELECTION SYSTMS	3- 7	5 3/4	-1	-14.8
O	COMPUTER HORIZONS	1- 1	5/8	0	0.0
O	COMPUTER NETWORK	1- 3	2 3/4	- 3/8	-12.0
N	COMPUTER SCIENCES	2- 6	4 1/4	- 1/4	-5.5
O	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
O	COMPUTER USAGE	2- 4	2 1/4	- 1/8	-5.2
O	COMSHARE	1- 4	3 1/8	0	0.0
O	DATATAB	1- 2	7/8	+ 1/8	+16.6
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	12 3/8	- 7/8	-6.6
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
O	KRANE ASSOCIATES	2- 3	2 1/2	0	0.0
O	KEYDATA CORP	2- 3	2 7/8	+ 3/4	+35.2
O	LOGICON	3- 5	3 3/8	0	0.0
A	MANAGEMENT DATA	1- 3	1 3/4	+ 1/8	+7.6
A	NATIONAL CSS INC	6- 14	10 3/4	+ 3/8	+3.6
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	13 1/2	-1	-6.8
N	PLANNING RESEARCH	2- 6	3	- 3/8	-11.1
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	4 5/8	+1 1/4	+37.0
O	REYNOLDS & REYNOLD	10- 24	13 3/4	-3 1/4	-19.1
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/4	+ 1/8	+11.1
O	TYMSHARE INC	7- 21	20 1/8	+ 1/2	+2.5
A	URS SYSTEMS	2- 4	3	- 1/8	-4.0
N	WYLY CORP	2- 4	3	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	8 3/8	+ 1/2	+6.3
O	ADVANCED MEMORY SYS	1- 7	4 3/8	- 1/2	-10.2
N	ANDEX CORP	3- 7	5 1/4	- 1/2	-8.6
O	ANDERSON JACOBSON	1- 3	1 7/8	- 1/4	-11.7
O	BEEHIVE MEDICAL ELEC	1- 5	3	0	0.0
A	BOLT,BERANEK & NEW	5- 13	7 3/8	- 3/4	-9.2
N	BUNKER-RAMO	4- 8	3 3/4	- 1/4	-6.2
A	FALCONP	4- 7	3 1/2	- 1/8	-3.4
O	CAMBRIDGE MEMORIES	2- 5	1 5/8	- 1/4	-13.3
N	CENTRONICS DATA COMP	7- 25	19 3/8	+1 1/4	+6.8
O	CODEX CORP	15- 38	37 1/4	+ 1/2	+1.3
O	COGNITRONICS	1- 2	7/8	+ 1/8	+16.6
O	COMPUTER COMMUN.	1- 2	7/8	0	0.0
O	COMPUTER CONSOLES	3- 7	3 3/4	0	0.0
A	COMPUTER EQUIPMENT	1- 2	1 3/8	- 1/8	-8.3
O	COMPUTER MACHINERY	1- 2	3/4	- 1/8	-14.2
O	COMPUTER TRANSCEIVER	1- 2	7/8	0	0.0
O	COMTEN	2- 5	3 3/4	+ 1/2	+15.3
N	CONRAC CORP	12- 29	29 1/4	+4 1/2	+18.1

EXCH		1975 RANGE [1]	CLOSE NOV 19 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 3	1 3/4	0	0.0
O	DATA 100	5- 16	10 1/8	+ 1/4	+2.5
A	DATA PRODUCTS CORP	2- 6	4 1/4	+ 1/8	+3.0
O	DATA TECHNOLOGY	1- 3	1 3/8	+ 1/4	+22.2
O	DATUM INC	1- 2	7/8	0	0.0
O	DECISION DATA COMPUT	3- 7	2 3/4	- 1/8	-4.3
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DYNAN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	1 1/4	0	0.0
O	FABRI-TEK	1- 1	5/8	- 1/8	-16.6
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	3- 6	3 1/2	0	0.0
N	HARRIS CORP	10- 32	31 1/4	- 3/4	-2.3
A	INCOTERM CORP	3- 12	7 3/4	-1 3/8	-15.3
O	INFOREX INC	2- 5	3	- 1/8	-4.0
O	INFORMATION INTL INC	8- 14	12	- 1/2	-4.0
A	LUNDY ELECTRONICS	3- 6	5 1/8	- 7/8	-14.5
O	MANAGEMENT ASSIST	1- 1	1/2	+ 1/8	+33.3
A	MILGO ELECTRONICS	8- 24	16 5/8	- 3/8	-2.2
N	MOHAWK DATA SCI	1- 5	2 7/8	- 1/4	-8.0
O	OPTICAL SCANNING	1- 3	2 5/8	0	0.0
O	PENPIL CORP	2- 7	3/4	- 1/2	-40.0
O	PERTEC CORP	2- 8	4	0	0.0
A	POTTER INSTRUMENT	2- 3	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1/2	+ 1/8	+33.3
O	QUANTUM SCIP	2- 6	4	- 3/4	-15.7
O	RECOGNITION EQUIP	2- 9	6 1/2	- 1/4	-3.9
N	SANDERS ASSOCIATES	3- 11	7 1/8	- 3/4	-9.5
O	SCAN DATA	1- 3	1 1/4	- 1/8	-9.0
O	STORAGE TECHNOLOGY	6- 17	10 3/4	- 3/4	-6.5
O	SYCOM INC	5- 22	23	-2 1/4	-10.1
O	T BAR INC	3- 6	6 1/4	0	0.0
O	TALLY CORP.	1- 5	2 3/8	0	0.0
O	TEC INC	1- 4	2	- 1/2	-20.0
N	TEKTRONIX INC	18- 43	42 5/8	+ 1/8	+0.2
N	TELEX	1- 3	2	- 1/8	-5.8
O	WANGCO INC	4- 9	7 3/8	+ 1/2	+1.2
O	WILTEK INC	1- 4	2 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 1/2	+ 1/4	+5.8
A	BARRY WRIGHT	5- 7	5 3/8	- 3/8	-6.5
O	CYBERNATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	32 3/4	+ 1/2	+1.5
O	DUPLEX PRODUCTS INC	12- 25	16	-1 3/8	-7.9
N	ENNIS BUS. FORMS	5- 7	5 3/4	+ 3/8	+6.9
O	GRAHAM MAGNETICS	5- 10	10	+1	+11.1
O	GRAPHIC CONTROLS	8- 21	13	- 1/4	-1.8
N	3M COMPANY	43- 68	61 1/4	+ 1/8	+0.2
O	MOORE CORP LTD	39- 51	48 1/4	+ 1/2	+1.0
N	NASHUA CORP	9- 22	10 1/2	- 3/8	-3.4
O	STANDARD REGISTER	11- 23	16 1/4	+ 1/2	+3.1
O	TAB PRODUCTS CO	4- 8	4 3/4	- 1/4	-5.0
N	UARCO	17- 24	21 3/8	+ 1/4	+1.1
O	VARIER GRAPHICS CORP	4- 7	4 3/4	+ 1/4	+5.5
A	WABASH MAGNETICS	3- 5	3 7/8	0	0.0
N	WALLACE BUS FORMS	15- 25	17 5/8	+ 5/8	+3.6

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NEWSPAPER



Where Do You Stand?

After visitors to "The Revolution" Bicentennial exhibition have made their decisions on how they would have acted in pre-Revolutionary days, a computer donated by Honeywell evaluates the ballot. Visitors are then compared to famous Bostonians of the period. See story on Page 4.

With Cash-Flow System

DP Helps Juggle N.Y. Debts

By Don Leavitt
Of the CW Staff

NEW YORK — As late as midsummer, this city's financially beleaguered administration was unable to tell the Municipal Assistance Corp. (MAC) how much money it would need to spend in the next 12 months on capital projects, according to Ricki Letowt, Budget Bureau computer systems manager.

Now, however, a newly implemented capital budget cash-flow system, based on Informatics' Mark IV file management software, is able to provide projections for not just one, but three years ahead, she said last week.

MAC is the New York State-based sponsored organization responsible for floating bonds for the city to help it avoid default. The question it raised in July was "perfectly intelligent," Letowt admitted, but apparently "no one had ever made an attempt to automate in any way, shape or form how much the city was going to spend over the next X months."

Payroll projections are fairly simple, she explained, but capital projects are completely different. Contract liability, for example, can be paid off in three months or in 10 years, so a lump sum of that liability doesn't provide any real information.

Letowt had been working with Mark IV before she went to work for the city five years ago. And the city had Mark IV on one of its computers, though it was not being used to any great extent, she said.

In any case, Assistant Budget Director William J. Sharkey and Letowt began putting together the requested projections and the software coding to manipulate the data in July. Just about that time, the Emergency Financial Control Board (EFCB) assumed power at a level higher than MAC and asked for projections reaching three years into the future.

Sharkey made a "ballpark" guess of what the overall figure would be and agency heads were asked to provide estimates of what their particular operations would require for capital projects over the coming 36 months. The sum of the individual projections was very close to the grand total guess Sharkey made earlier, Letowt added.

The people who reviewed those initial projections "were pretty much flabbergasted" by the grand total, she went on. They started looking at the individual figures far more closely than they had before and began chopping with a vengeance and a clear direction.

Austere Budget

It wasn't surprising to see the totals drop by $100 million as each set of new projections was posted, she said. In any case, a more austere but better understood picture of the city's future in capital budget projects emerged.

Since then, Letowt has entered the actual expenditures of each agency as they become known at the end of each month. Thus far, she noted, the "actuals" have tended generally to be under the projected figures for the month.

But, she cautioned, that doesn't mean anything because "all of a sudden, one month, a bunch of big bills can come in."

(Continued on Page 4)

Seen Affecting Sales

Honeywell Policy Upsets Users

By Nancy French
Of the CW Staff

CLEVELAND — Honeywell's decision to charge owners of used computers a software license fee and its refusal to guarantee maintenance on machines that are sold by individuals on the used-computer market are bound to have ramifications on the sale of new equipment, Bill White, president of the Honeywell Users Group for Small and Medium Systems, said after the group's recent meeting here.

People at the meeting were "extremely unhappy" because Honeywell has, in effect, devaluated their equipment by the price of the software, White explained.

Over the years it has been Honeywell's policy to sell a user his computer after he has leased it for a certain period of time.

Now purchasing will be a bad decision for the user because he's going to have to buy that software from Honeywell and offer it with the system when he sells it to get his money's worth, White said.

Users who purchased systems recently from sources other than Honeywell and were worried about paying enormous prices for software were relatively relieved about Honeywell's recent price concession [CW, Nov. 12]. Further new policies won't hurt the user who plans to keep a system well beyond its economical life, but the average user is going to hesitate before purchasing any system he is now leasing, White predicted.

Nothing But Praise

But Jesse Williams, vice-president of General Service Center, Inc. of Memphis, who also attended the meeting, had a different view.

"I think Honeywell's done all right by us — it's supported us and I can do nothing but praise Honeywell," he said.

"Honeywell's got to make a profit to stay in business, doesn't it? Why should I carry the load for people who buy from sources other than Honeywell? Why shouldn't these other users contribute to Honeywell's profit base the same as I do and reduce some of my costs?" Williams asked.

General Service Center has an H200 and an H2015 and the firm is going into OS/2000 right now. All equipment was obtained from Honeywell.

(Continued on Page 4)

Loopholes Said to Exist in All Systems

By Edward J. Bride
Of the CW Staff

NEW YORK — Loopholes which facilitate DP-aided fraud "exist in all business systems," either by design or oversight, according to Leonard I. Krauss, manager of Ernst and Ernst's Management Consulting Services.

It is, therefore, necessary for managers to "have a formalized approach" to fraud analysis, including "multiple lines of defense" against perpetrators.

"There are no perfect answers," Kranss told attendees at the Second Annual Computer Security Conference Workshop held here recently. Management must therefore get "reasonable" answers.

Computer crimes tend to be 100 times more profitable than traditional noncomputer crimes, Krauss said. He used the example of a recent bank fraud which resulted in a loss of $1 million, while under similar circumstances in earlier days, the loss "would probably have netted $10,000 or so."

Donn Parker of the Stanford Research Institute indicated that the national average for bank frauds was $19,000, while the average for computer-aided bank frauds which he has investigated was $450,000, or a ratio of less than 25 to 1.

Whatever the numbers, "when computers are involved in white-collar crime, losses are significantly higher," Parker said.

Systems programmers represent "the single largest technical risk" an installation may have, Krauss said, advising attendees to "take extra special precautions" in monitoring their work.

The chief reason for this threat is that systems programmers often have access to all hard-

(Continued on Page 6)

Government, IBM Await Vacating of 'Gag Rule'

By Edith Holmes
Of the CW Staff

NEW YORK — Now that they have deemed the gag rule in the U.S. vs. IBM antitrust suit unconstitutional, both the government and IBM expect the federal district court judge hearing the antitrust case to designate Pretrial Order No. 4 null and void momentarily.

Even though IBM originally asked that communication between the parties and the public and press be restricted, and the government assented to the entering of the order in May 1972, the parties recently presented the court here with briefs arguing the gag rule's unconstitutionality.

The government's brief was filed with the court at Judge David N. Edelstein's request following IBM's motion that Pretrial Order No. 4 be vacated [CW, Oct. 22].

"There can be no doubt about the unconstitutionality of Pretrial Order No. 4," IBM argued in its memorandum asking the

(Continued on Page 2)

L.A. Man Charged in Theft Of T/S Company's Time

LOS ANGELES — A 42-year-old DP executive, accused of stealing computer time and using someone else's password to gain access to the system, has been arraigned in municipal court here.

Charged with one count of grand theft and four counts of grand fraud, Marvin H. Maki was released on his own recognizance pending a preliminary hearing on Dec. 9.

Maki, employed by W&R Tool and Manufacturing Co. of North Hollywood, is suspected of having used computers owned by Manufacturing Data Systems, Inc. (MDSI), a time-sharing firm, to process data for W&R Tool.

Maki, who worked for MDSI until June, allegedly used information learned as an MDSI employee to gain access to that firm's computer systems.

After Maki left MDSI, the firm's branches in London and Paris discovered they were being billed for computer time they had not used.

MDSI officials suspect Maki

(Continued on Page 4)

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Brief Says Software Patent Should Stand

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – The U.S. Patent Office has no jurisdictional right to take the Thomas R. Johnston case to the U.S. Supreme Court – but as long as the court has agreed to review the matter [CW, May 21], there are plenty of arguments in favor of allowing Johnston's patent for software to stand, according to his attorney.

Oral arguments before the high court are now scheduled for Tuesday, Dec. 9.

In a 70-page brief filed recently, attorney Morton C. Jacobs contended the Patent Office had no legal grounds on which to challenge the findings of its own Board of Appeals and of the Court of Customs and Patent Appeals (CCPA), each of which ruled in favor of the inventor after the Patent Office rejected his application.

Johnston is seeking patent protection for a bookkeeping system for small businesses. The system is based on encoding and later sensing of extra digits in the magnetic ink character recognition (Micr) stripe at the bottom of the user's checks and deposit slips handled by a bank.

The logic of the system is embedded in software programs which, in Jacobs' eyes, convert the general-purpose computer in which they execute into a special-purpose machine. If a machine meets certain other criteria, it is legitimate subject matter for patent protection.

Patentable as Machine

Johnston's invention is patentable as a machine, Jacobs asserted in his brief, because it is indeed a "new machine." It "achieves a unique end result without [in the words of the CCPA ruling] "a human being inside or outside [the] apparatus," the attorney continued.

The Patent Office argued Johnston merely has a new use for an old machine. That argument "is directly contradicted by the [Patent Office's] own concession of the 'possibility of patentability' of software-embodied inventions and by the facts of the nature of programmed computers," Jacobs went on.

" 'The program reconstructs the computer,' " he said, quoting Prof. Ivan Flores, and added the Patent Office, in its *Guidelines for Examination of Computer Programs*, recognized the stored program "converts the 'warehouse of unrelated parts' of the general-purpose computer into a 'special-purpose machine.' "

The Patent Office Board of Appeals followed essentially that idea when it overturned the first denial of Johnston's application, he said.

Hardware and software programming are equivalent and alternative approaches for the construction of computer systems and, as such, are equally patentable, Jacobs told the high court.

"The Patent Office's 'new use' argument does violence to the technological facts of computers," he added a few pages later.

Pursuing the contention that hardware and software may provide equivalent approaches to building computer systems, the attorney built an argument based on the requirement for "equal protection" under the law.

Without the sense of protection afforded by patent rights, software inventors would have no incentive to pursue their work, he said.

And, without software, the general-purpose computer of today has little value, Jacobs added.

U.S. Government, IBM Expecting Edelstein to Overturn Gag Rule

(Continued from Page 1)

judge to vacate the "gag rule." Relying on a case decided this summer which related to the rights of the parents, family and friends of those students killed at Kent State University in 1970 to talk to the press about their cases, attorneys for IBM contended that in the government's suit, as in CBS, Inc. vs. Hon. Don J. Young, the First Amendment right to freedom of speech should hold sway.

Gag rules are only applicable where coverage of a case by the press will threaten the fairness and integrity of a trial, the defense said. And the attorneys added, "There is no jury here, as there was in CBS vs. Young, susceptible to influence by publicity."

Government attorneys, too, determined the gag rule unconstitutional and asked that it be vacated.

The Department of Justice noted there is very little precedent on which to assess the constitutionality of a gag rule in a civil trial where a judge alone will decide the case.

"Most of the standards that have evolved concerning pretrial publicity involve criminal cases in which the defendant's Sixth Amendment right "to a speedy and public trial by an impartial jury" is jeopardized," the government said.

"Any restrictions imposed upon public comment, even if necessary to assure a fair trial, tend to clash with First Amendment interests," the plaintiff in this suit noted further.

Less Justified

The government cited a case in which an appellate court decided "no-comment rules [are] generally less justified in civil proceedings than in criminal proceedings" because a civil trial like U.S. vs. IBM often does not have a jury.

A judge is expected to be able to ignore out-of-court comments and to separate and weigh the relevant evidence presented in court in his or her mind, the attorneys added.

In addition, the government noted "civil litigation will ordinarily be more protracted than criminal litigation so that the 'broad time span' of a no-comment rule 'is an influential factor weighing against its constitutionality."

Witnesses Influenced

Witnesses may be influenced by media accounts of a trial or by the comments of the lawyers involved concerning their testimony; out-of-court comments by the parties may have a significant impact upon the industry that stands to be affected by the litigation; and both the parties and the judge will have the responsibility for responding to numerous press inquiries and addressing disputes over the accuracy of statements made in the course of a lengthy trial.

But, the government noted, the court did not base Pretrial Order No. 4 on these considerations; instead, the judge imposed the gag rule on the basis of an interest in "accurate, objective, dispassionate and fair comment and reporting."

While concluding that the gag rule should hold no longer, the government seemed to anticipate publicity excesses once the order is lifted and warned at the close of its memo, "It is to be expected that counsel in this ligitation will conduct themselves in a manner befitting their status as officers of the court."

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With $250 Million Already Spent

Congress May Force End to Air Force Inventory Project

By Patriek Ward
Of the CW Staff

WASHINGTON, D.C. – The U.S. Air Force may soon be forced to abandon an "overambitious" data base/data communications project that has already cost about $250 million but remains far from completion.

The House of Representatives has votcd to terminate the project, the Advanced Logistics System (ALS). The Air Force and the Senate Appropriations Committee, however, favor a "get-well" plan that would switch the project from an on-line to a batch-oriented operating system.

Even this alternative would take two years and cost $481 million in development and operating costs through 1982, the Air Force said.

But the Air Force estimated the revised ALS system will still save it $307 million over the next seven years, primarily in manpower savings and inventory reductions.

Begun in 1968, ALS was to bring the latest in computer technology and management techniques to Air Force inventory management. But the projcct "turned out to be too much to swallow," in the view of a House Appropriations Committee spokesman.

The Air Force tried to jump from second-generation to fourth-generation DP technology in one leap, according to a spokesman for the Senate Committee on Appropriations.

The plan called for seven large-scale CPUs in five Air Force logistics centers around the country. Each logistics center would have a unified data base replacing "many independent and hence often inconsistent" data bases on other machines.

In all, the seven third-generation ALS computers would have replaced about 90 second-generation machines, including IBM 1401s and 7080s, Univac 1107s and RCA 301s.

Each logistics center would be linked with the others over dial-up lines. Each center would also support about 500 data entry and keyboard/printer terminals to provide "current and consistent information to all ALS users," the Air Force said.

The plan envisioned an average of about 50 112M-character disk drives at each site. The entire ALS system was to process some 72,000 transaction/hour around the clock.

CDC Reliability 'Disappointing'

In April 1972, Control Data Corp. won the bidding to provide ALS hardware and software. The large processors were to be 65K word Cyber 73s and Cyber 74s, with SC 1700 small computers handling communications at each site.

"Although the Cyber CPU had speed and versatility, the reliability of the equipment was disappointing," the Air Force said in a follow-up report.

"Failures of key components such as extended core storage, remote devices and some communications interface computers hampered operations.

"Extended core storage failure taking only 30 minutes to repair can cause a production delay lasting much longer," the Air Force reported.

Though the original intention was to rely on off-the-shelf proven software, ALS became the first operational user of CDC's Zodiac transaction-oriented operating system, according to Robert M. Flaherty, chief system engineer at Wright-Patman Air Force Base.

"About 1,500 program trouble reports were submitted against Zodiac software. Of this . . . approximately 180 were catastrophic," the Air Force report noted.

Housekeeping functions such as "control, insuring data integrity, opening and closing files and preventing systems from interfering with each other" took excessive system resources, the Air Force said.

"The data base structure, designed with many family tree branches and . . . keys, fosters excessive consumption of processor time," according to the Air Force, However, the elaborate structure "docs permit user flexibility."

Because of thesc and other difficulties, only two of the large-scale computers are now doing production work. If the House prevails, the Air Force will drop further work on the project.

The Air Force and the Senate Appropriations Committee, however, think it unrealistic to expect this equipment mix to handle an adequate inventory management program.

Davis Warns Privacy More Than Security

WASHINGTON, D.C. – Privacy is more than system security – it involves such concerns as data collection, information management practices, auditing and systems and software integrity as well as systems and network controls, encryption and physical security, Dr. Ruth Davis told the Privacy Protection Study Commission recently.

Davis, director of the National Bureau of Standards' Institute for Computer Sciences and Technology, called for the commission to determine the present state of the art, pinpoint its deficiencies and make a contribution by focusing research in nceded areas.

Research and development presently under way in privacy-oriented areas is "fragmented and not focused," she said.

Most of the projects "are described as computer or information system security research and development" and their results are often applicable to privacy problems, even though they were not so justified initially, she said.

Among those "fragmented" projects Davis cited were 13 privacy-related projects now going on within the Department of Defense (DOD), the National Science Foundation (NSF) and the National Bureau of Standards, as reported by the Smithsonian Scientific Information Exchange.

In the private sector, about 20 different organizations are conducting significant research in information protection and related activity, she said.

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Patriot or Loyalist?

Mini Analyzes Political 'Spirits of '76'

By Naney French
Of the CW Staff

BOSTON — Patriot, loyalist, neutral or undecided?

A Bicentennial exhibit here is using a computer to answer that question for thousands of visitors to this city by analyzing their opinions on political issues of the Revolutionary period.

Visitors are shown multimedia presentations on such things as the Stamp Act, the Boston Massacre, the Boston Tea Party and the siege of Boston. After each presentation, they are asked to vote on the issue.

Those considering the Tea Party, for example, can choose between unloading the cargo or dumping it into Boston Harbor.

On the siege of Boston, they can decide to leave their homes and join the patriots' cause or stay put and take their chances.

Visitors enter their choices on a CRT terminal and a minicomputer analyzes the responses. It then compares the visitor to a prominent Revolutionary figure who had similar political leanings and the information is displayed on the screen.

One such comparison tells the voter, in part, that "like Daniel Leonard, you began as a lukewarm patriot and ended up as a loyalist."

The computer also keeps a cumulative total of the number of patriots, loyalists and undecideds. This information is updated and displayed every 40 seconds.

'Electronic History Book'

Another feature provided by the minicomputer is an "Electronic History Book" available to visitors as they enter the exhibit. By typing page numbers at a computer terminal, visitors can read video-displayed information about some 70 leading figures of Revolutionary times.

Designed by Dr. Joseph J. Eachus, a staff scientist at Honeywell's computer operations here, the system is built around a 16K Honeywell Model 716 minicomputer. Two disk drives are attached to the processor, and 13 Model 775 VIP display stations are available for use by visitors.

Sponsored by Sun Oil Corp., the exhibit is entitled "The Revolution: How It All Began." Located on the second floor of the newly renovated Quincy Market Building opposite Faneuil Hall in the downtown section of the city, it will run through early 1977.

'Mark' Helps MAC Keep New York Afloat With Cash-Flow System

(Continued from Page 1)

Despite that justified concern, the system has provided detailed projections, the facility to modify those estimates and the means to compare them to actual experience.

Congress Interested

And the output of the system has been of interest to Congress, according to Letowt. She recalled that one day when the 370/155 she uses was down "everyone was in a panic because the delay was 'holding up a plane to Washington.' It was true," she smiled. "One of the committees in the House or the Senate was waiting for the reports we were supposed to be running."

Although she has a couple of assistants who can code simple reports with the Informatics software, Letowt said she has done most of the capital budget coding herself. "I guess I'm the city's Mark IV expert," she said.

She's using Mark IV/260 Release 5.0 – a fairly recent release – and many of the special features that are available with it. She said she has Table Lookup, Indexed Core File support, Extended File Processing and Extended Transaction Processing.

But the feature she obviously likes best is Extended Segment Processing, which allows direct comparisons and matchups between segments within the files being managed. ESP is the feature's acronym "and that happens to be sort of appropriate for us at this point, doesn't it?"

There are a number of good report-generator systems now available, she volunteered, but Mark IV has a really good file maintenance system in front of it "which doesn't hurt anything at all." Thinking aloud, she said, "I don't know who the mad man was who first thought up this system, but it's a good one."

It's grown over the years and the vendor's support has always kept pace, she said.

Honeywell Policies Seen Hurting Sales; Users 'Extremely Unhappy'

(Continued from Page 1)

Mike Phillips, senior systems programmer at Blue Cross/Blue Shield of Delaware, said his management is "not too upset with the policy because it thinks [the policy] is going to be changed.

"But some of our local users have been affected," he noted. "For example, one company that bought a system a few years ago from Honeywell for $950,000 wants to switch vendors and the best offer it has had for the system is $50,000."

John I. Dosky, vice-president for The Computer Place, a Cleveland-based used equipment dealer, agreed with Phillips.

Sales for a full system have gone down because of the uncertainty of the software licensing charge and the problem with guaranteed maintenance, he said.

Transfer May Cost More

Transfer of a system may incur some additional costs as the policy is defined now, he said. "Receiving districts are very careful in accepting equipment for maintenance – there seems to be a judgmental situation when it comes to evaluating a system, and they do it differently from district to district."

Wilson Grabill, who is with Dugan and Meyers Construction Co., a Cincinnati company, called the Honeywell Policy "unbelievable.

"This is some of the most strong-arm stuff I've seen in business since Patterson [former president of NCR] sent his troops out to destroy his competitors' adding machines," he said.

"I think it's a colossal blunder – the damage Honeywell is doing to its reputation is unbelievable, but worse still, nobody seems to have the guts to go back and say they were wrong," Grabill said.

Won't 'Stick' in Court

Most agreed Honeywell won't be able to "make it stick" in court.

Grabill pointed out "there is no definition as to whether a program or a piece of software is a writing." If it is – and if it can be copyrighted – Honeywell has not taken the proper steps to protect that software because prior to July it was given away "as a common practice," he said.

"If you want a copy of the latest revision, Honeywell systems engineers would give you a disk pack with the software on it. You can't do that with a copyright," he said.

"If you're going to charge a license fee, you must take all reasonable steps to protect that copyright, and Honeywell did not do that. That software is in the public domain," Grabill said.

The National users group intends to "fight" the policy and has organized a special interest group to study what it can do from a legal standpoint to force a change, according to White.

This users meeting clarified the policy – "it wasn't clear what Honeywell really intended to do or what the costs actually would be until then. Now we understand it," he said.

"Next March at our Denver meeting we plan to present Honeywell with our opinion and try to demand a change. If interest is strong enough in the group, we might consider a class action against it" he said.

However, "a lawsuit of this kind could cost a quarter of a million dollars, and that's a real strong point in Honeywell's favor. If it's expensive enough to fight it, Honeywell can get away with it in spite of everything," White said.

Court Charges L.A. Executive With Theft of T/S Firm's Time

(Continued from Page 1)

used passwords assigned to the English and French branches to access their systems, according to a spokesman for District Attorney John K. Van de Kamp.

Investigation revealed the passwords were used in calls to the computer from Los Angeles telephones from June through October.

Evidence allegedly linking Maki to the crime was obtained when police investigators obtained a warrant to search Maki's home and office.

"One of the things Maki was doing was using the MDSI computer to produce a punched tape that was used to run W&R Tool's manufacturing machines," an investigator claimed.

In addition, Maki allegedly used the MDSI system to process the tool company's accounts receivable.

Maki is alleged to have used the system for 143 unauthorized hours which, had he been billed, would have cost $15,000, the district attorney's spokesman said.

"Computer crime is presenting a prodigious challenge to law enforcement and imaginative approaches are required to deal with the problem," according to Van de Kamp.

As a result, several staff members of the district attorney's major frauds section are taking a crash course on computer technology.

The W&R Tool and Manufacturing Co. has not been named in the case.

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Datapro as reported in Computerworld, p.14, Jan. 22.

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Stu Fletcher, Programming Manager Cal-Farm Insurance Company.



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by Glenn ImObersteg

Broader Mutual Backup Aid Suggested

By a CW Staff Writer

NEW YORK – The "standard" plan of computer users for backup processing facilities may not always be feasible for any of several reasons, and a "more broad mutual-aid arrangement" was suggested to attendees of the recent Computer Security Institute (CSI) conference here.

Belden Menkus, an independent consultant and member of the institute's advisory board, outlined reasons for possible failure.

Equipment configuration may not be totally compatible, Menkus said.

Sufficient processing time may not be available at the alternate site, he also noted.

Finally, there is the problem of the common disaster such as the floods which have been experienced in the East in the past three years, tornadoes, or the fire last February at a telephone company switching center, which affected some 140,000 phones.

Menkus, who is also editor of *Computer Security*, the newsletter of CSI, thus proposed a broader mutual-aid arrangement for users to consider. While details of such arrangements will be covered in the next issue of the newsletter, the points are summarized as follows:

- Participants agree to aid each other during and after a disaster, with the applications being split among several sites, not just one backup.
- With the workload allocated to several "unscathed participants," the participants absorb the processing costs as an investment in their own future backup.
- A coordinating committee sets security standards and conducts disaster-recovery simulations.
- Sensitive or proprietary data may be processed at a closely controlled commercial service organization, thus getting around any problems or conflicts or cooperation with the competition.
- Participants may be geographically remote, solving the problem of the common disaster.

Information on the newsletter and CSI programs is available from the institute at 43 Boston Post Road, Northboro, Mass., 01532.

No Perfect Answer Seen Existing To Problem of Fraud Prevention

(Continued from Page 1)

ware, programs and data files and are exempt from normal access control procedures.

He also advised attendees to notice changes in personnel behavior, especially at the management level or in people who have access to assets, records, etc.

Krauss recalled the suicide of a financial systems manager shortly after an audit was announced. While the case is still under investigation, and there are no conclusions as to the manager's complicity in any fraud, Krauss said the manager did exhibit noticeable behavior changes months before the impending audit was announced.

CW at CSI

But, rather than watching specific people, it is the "functions" which must be monitored closely, he said. For example, audits should be made of control procedures over payouts and receipts, among other areas.

Krauss suggested watching for the following:

- Operating interventions, such as abnormal interrupts which could permit a person to enter "private data" or to override and ignore error-control procedures.
- Irregular master file updates, which he compared to "keeping a second set of books." This process can be used to change the status of a file, such as increasing a person's credit limit or hiding the status of delinquent accounts.
- Programmed traps in applications or systems programs. These interface with normal operation. They can be used to forge instructions to an operating system and make "bogus changes."
- Programmed "magic code" which is similar to traps, except no evidence is left except during the actual fraudulent processing. The stories of hidden code which in effect "creates itself" and then disappears are valid, Krauss indicated.
- Input capture and alteration, which is typically accomplished by people with access to documents where controls are sloppy.
- Output capture and alteration by people with access to output reports. These people can alter exception reports, especially on terminal displays, he noted.

Finally, there is the instance security consultants have come to call the "salami swindle." Krauss reported a case in which a programmer "sliced off" rather than rounded off fractional shares bought in an employee investment plan and transferred the fractions to his own account. When caught, the programmer had allegedly credited his account with some $380,000 worth of securities, Krauss reported.

'Sleuthing the System'

There are several things to look for in "sleuthing the system" against would-be perpetrators of fraud, and Krauss used the Equity Funding case as an example of such items.

The first item to look for is too many tapes being stored in the library; these tapes may have the perpetrators' versions of the master file. As a countermeasure, Krauss said regular listings and audits need to be made of the inventory list itself, as well as the tapes.

Another sampling needs to be made of header labels, to make sure the tape contains the same data or records as indicated on the external label.

A regular examination of the library log should be made, he continued. For example, check the date of creation on a certain tape against its first logged entry into (or withdrawal from) the library.

If there is no log entry around the date of creation, then the tape may have been added to the library surreptitiously.

A regular and surprise verification of all the above information in the backup tape library should also be made, he noted.

Another item was referred to as "Mickey Mouse" update programs. In the case of Equity Funding, there was a tape called "Phoney of the Master File," Krauss said, adding normally the fraudulent tapes "are not so obvious."

As in other technical problem areas, the solutions lie both in technology and in procedures used to control people, Krauss said. Thus, there are several methods which can be used to help close the loopholes, he noted.

Some of these loopholes exist by design, i.e., they may be too expensive to close, and others simply by oversight, he noted.

The first thing to change is overlapping duties of people in responsible positions, Krauss noted. For example, in a case in which a computer operator was able to forge checks (payable to friends rather than to authorized vendors) and then destroy them when they were returned to the center, Krauss said the preparer of a check should not be involved in its reconciliation.



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'Who's Looking?' First Query

Security-Conscious Users Told Three Questions Vital

By Edward J. Bride
Of the CW Staff

NEW YORK – Who is looking for fraud in DP centers? How do they analyze the various risks? And what countermeasures are available to protect the DP center?

If one had to sum up the main issues facing computer users today in the realm of security, these three questions should he asked, according to three speakers at the second annual conference of the Computer Security fnstitute held here recently.

As to who is looking for fraud, users might be tempted to answer "the auditors," but one speaker threw water on that theory.

Joe Wasserman, president of Computer Audit Systems, described the Systems Accountability Control (SAC) Project funded hy fBM and the Institute of Internal Auditors.

The SAC project consists of surveys and interviews to determine the state of the art of computer auditing and control, Wasserman explained. Other goals include setting the proper perspective on auditing/control within the systems environment and increasing management awareness of the need for controls.

Wasserman, a member of the 46-person SAC advisory committee, predicted that, when the report is complete next summer, "we won't find much activity" by auditors looking for fraud.

An audience member later commented that, since fraud is difficult to detect, it is the last priority for auditors, who look for errors, omissions and accounting consistency.

Wasserman agreed "detection is extremely difficult," but noted it is heing done hy "a finite numher of companies."

More and more auditors are checking security and disaster plans, as well as policy on records retention, he said.

CW At CSI

Management awareness of the need for controls is an area in which many companies are weak, Wasserman continued, adding the weakness of management awareness is true of "any computer security function."

Risk Analysis

The beginning of any risk analysis project is to study the threats and the possible losses to an organization, and Robert V. Jacobson presented some methods of categorizing these areas.

Jacobson, conference chairman and an assistant vice-president at Chemical Bank in New York, indicated there are three potential loss categories: degraded productivity, DP assets and other organizational assets.

There are 10 categories of assets, many of which can be tampered with through the computer: cash and negotiables; goods and materials; services; receivables; proprietary information; machinery and equipment; buildings and grounds; confidential information; business records; and trained personnel.

Among the threat categories are acts of nature (which are "indifferent" to the existence of the DP facifity), sabotagc, theft and internal breakdowns, Jacobson continued.

Using these categories or further subcategories, users shoufd determine the precise threats and possible losses in order to set their own priorities for protection, hc said.

The analyst, risk manager, DP manager and senior management must then "think about the prohlem in a disciplined, structured way" which will prôvide a "common basis for discussion" where "comprehensiveness is assured," Jacobson said.

Trivial losses can be ignored so management can focus its attention on the serious exposures, he asserted. And the selection of countermeasures can be balanced against the reduction of expected losses.

Security Countermeasures

As for countermeasures, control procedures are really what help prevent incursion into a computer system, according to Peter S. Browne, manager of the security operation at General Electric Information Services' Business Division.

These countermeasures are found in containment of threats, deterrence, obfuscation of the assets and recovery from problems, Browne said.

For example, one might isolate an asset to reduce the probabifity of theft or manipulation; this can be accomplished by controlling access to the "target" or plugging "holes in defenses" (operating systems), Browne noted.

The protective strategy against the very motives of perpetrators is to advertise punishment of previous offenders and/or increase thc chances of being caught, Browne said.

Punishing offenders presents a prohlem in itself because many organizations refuse to prosecute embezzlers, whether their crimes are manual or computer-aided, according to Browne and most other speakers on the program.

Reviewing audit trails will also detect frauds early, thereby reducing losses and presenting a deterrent to woufd-be thieves, Browne said.

Obfuscation or concealment, of assets is aecomplished through cryptography, which reduces the probabifity of incursion; tighter control over proprietary information also reduces this probabilitity, he noted.

Additionally, the dispersion of assets, facilitated by advances in data communications, reduces any losses shoufd incursion occur, he continued. Alternative processing and multiple-location processing are the items to be considered here, Browne said.

As for recovery from a catastrophe, users need to fook to other sites or resources and should afways have contingency plans, he said.

The cost of these and other measures need to be determined according to any products that might be involved (audit software packages, hardware, etc.), plus site preparation, supervision, test and acceptance and monitoring.

Weighing these one-time costs plus operating costs against possible losses is the onfy way to ascertain the cost-effectiveness of countermeasures, Browne concluded.

DPers Possibly Facing Insurance Crisis Soon

By a CW Staff Writer

NEW YORK – Computer users may he facing the same type of insurance crisis as doctors and others concerned with malpratice hecause protection from errors and omissions may no longer be available in two or three years.

This is of special concern to DP service bureaus and users of in-house systems who do work for others, according to Guy Migliaccio, vice-president of Marsh and McLennan, Inc., insurance brokers.

"If you do service work for others," he cautioned, "you may be liable for errors." Even if a user is leasing equipment directly from a manufacturer, "don't think you're necessarily covered by the manufacturer's insurance," he warned.

Addressing about 125 attendees at the second annual conference of the Computer Security fnstitute (CSI) here recently, Migliaccio said that, with the possible disappearance of error/omission insurance, uscrs need "more clarification" with their customers on the responsibilities involved in processing information.

If the user is willing to cover the first $100,000 of damages, he noted, then an insurance company might be "more wilfing to protect you.

"Neither the leasing nor the insurance industry has even recognized the special problems" of data processing fiability, let alone solved them, he said.

Liability for errors and omissions is "the most troublesome" for which to attain coverage, he continued, adding "cven Lloyds of London is backing away" from this type of protection.

"By the end of next year, only two or three companies will be offering" this coverage, he predicted.

DP insurance is expensive, Migliaccio noted, hecause the equipment itself is expensive and often concentrated in one place. Additionally, the gear is often difficult to replace, which makes insurance for "business interruption" expensive.

Data itself is concentrated, and physical damage may come in many forms: the media, equipment, lost processing time, etc., he noted.

In buying insurance, the user can save money hy scrutinizing the policy to eliminate redundant coverage, he advised. For example, if the policy on a building covers fire or floods and that policy also covers equipment in thc building, then specific coverage on the DP cquipment may not be needed.

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Israeli Teacher Strikes Have Genesis in System Switch

By Alex Ragen
Special to Computerworld

JERUSALEM, Israel – For the third time this year, The Israel Teachers Association is threatening to strike over the Education Ministry's failure to pay back salaries dating to 1972.

What makes this labor dispute unusual is the fact that the employer is more than willing to pay the money, as well as interest and cost-of-living increments, but is unable to do so because of problems with the computer programs which are supposed to calculate exactly how much is coming to each teacher.

The story began in 1973 when the ministry outgrew its IBM 360/40 and began looking for something bigger. The government's Steering Committee on Data Processing, anxious to break IBM's dominance in the government sector, decided to bring in a non-IBM computer and, after a long series of proposals and counterproposals, the ministry ordered a Burroughs B4700.

The staff at the ministry was almost unanimously opposed to the Burroughs computer – it wanted an IBM 370 in order to minimize conversion problems – and, when the computer arrived in late 1974, some 80% of the staff resigned, most taking jobs at other government-owned IBM installations here.

The effect on the most critical of the ministry's systems – payroll – was disastrous. Many of the programmers who left were openly hostile to the staff of Burroughs' local agent, Tamkin Ltd., and essential documentation and files sometimes "disappeared."

The ministry's new staff was unable to get the payroll out in January, and teachers were given advances against a salary to be calculated sometime in the future.

Teachers Walk Out

In February the teachers walked out for one day, charging that many of them hadn't gotten any advance at all and that no progress was being made on the issue of back pay. In fact, the calculation of back pay had been neglected in the rush to get the current work done.

Only the personal intervention of the minister of education and his promise that everything would be straightened out by the end of the school year prevented the strike from going beyond the first day. But the teachers struck again in September and are now threatening another strike, since their demands have still not been met.

Moreover, there are teachers who have been getting advances instead of salaries for more than a year, and each month others vanish from the master file. By this time, assurances by cabinet ministers have lost their value in light of the Education Ministry's continuing inability to get the salaries out, some teachers feel.

During the February strike, articles in the Israeli press implied the problems began when the IBM computer was replaced by the non-IBM computer. In reality, the picture is much more complex.

Even in the IBM days, the ministry had great difficulties getting the payroll out on time. Although it is not widely know, one of the reasons the Steering Committee on Data Processing insisted on switching from IBM was its desire to force the ministry to convert the system in hopes the rewrite would be an improvement.

One by-product of the incident has been the enhancement of IBM's prestige in Israel. IBM has more than two-thirds of the local market and is doing very well – the foundation for IBM's skyscraper headquarters was laid last month in Tel Aviv.

At Tamkin, on the other hand, sales have nearly ground to a halt. In fact, two companies in the last four months have retumed computers to Tamkin and ordered IBM computers in their place. In both cases, the firms are suing Tamkin over its alleged failure to get the hardwarc and software working as promised.

At this point no one knows what will become of the teachers' back pay but, as someone at last month's trade conference in Jerusalem said, "Everyone in Israel has at least five friends who are teachers, and they and all the schoolchildren know the only good computers are IBM computers."

List Discovery Starts Dispute on Marriage

JERULSALEM, Israel – A computer system used by the Isracli government to uphold a 2,000-year-old marriage law has been caught in the middle of conservative and liberal politicans' arguments.

The Israeli Ministry of Religious Affairs used the system to maintain and update a list of pcrsons who by Orthodox Jcwish law might not be permitted to marry.

Religious officials maintain the list is necessary to block bigamous weddings and other illegal marriages as specified in the Talmudic law code.

Discovery of the list has sparked controversy over the absence of civil marriage in Israel.

The computerized list was unearthed recently by Shulamit Aloni, a member of the Knesset, or parliament, who criticized the list as a technique not unlike those used by the Spanish Inquisition 400 ycars ago to persecute Jews.

Religious Affairs officials claim the list is merely a record of those persons who have gone before the rabbinical courts, which determine wedding eligibility under Jewish law.

Even when a person's qualifications of marriage suitability have been questioned by a rabbinical court, ministry officials added, the person can appeal to a higher court and be removed from the list.

Since there are no civil marriages, in Israel, however, liberals in the Israeli government have labeled the existence of the list "McCarthyism" and insisted the list be abolished.

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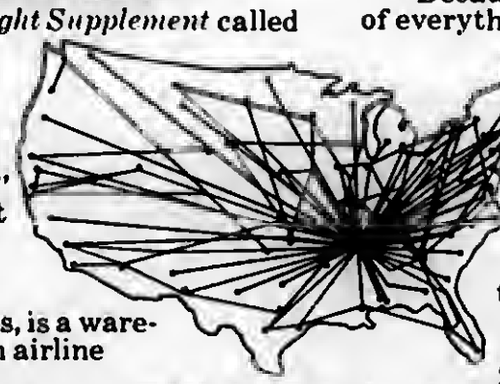
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Editorials

A Political Vendetta

The New Hampshire Centralized Data Processing (CDP) agency has lost another skilled professional. Arthur Hill has found it necessary to leave the post of CDP director because of increasing attempts by state politicians to insert themselves into his day-to-day operations [CW, Nov. 26].

It is to be expected that any central DP organization will draw resentment from other agencies if it loses control over its own accounting and other functions. But this has not been the problem in New Hampshire. The CDP staff has tried to enhance the state operations, not alter them.

Governor Meldrim Thomson has converted an inbred ignorance and distrust of computers into a political vendetta against the CDP agency. In truth, the efforts of Hill and his staff have saved state agencies countless thousands of dollars in more efficient DP operations. Yet Thomson claimed millions of dollars have been wasted.

Unless a central DP organization in a state or business gets full support for its activities from the chief executive, it operates with a serious handicap. In New Hampshire, there is an additional problem in that Thomson and his aides have complained about CDP waste and have bird-dogged the agency to substantiate their charges.

It is doubtful whether the present state administration will allow CDP to operate as an autonomous agency, no matter who succeeds Hill. What is needed is a new outlook from the top and a governor who will take pride in the accomplishments of a centralized CDP agency instead of fearing it.

Wait and See

At this time it is important to warn readers following the progress of the U.S. government's antitrust case against IBM.

To date there has been a great deal of publicity about the case in *Computerworld* and in other publications. This will continue and perhaps intensify in the next few months.

But so far — and here is the warning — only one side of the case is being presented in the courtroom. That is the government's case against IBM.

So the record of the case covers only the charges that are being made by the government. The government will continue presenting its side of the case for about six more months.

After that, IBM will have its chance to defend itself from the charges — an action that could take a year, if not more.

When reading articles on the case, this should be kept in mind, and readers should not form opinions before all the evidence from both sides is in..

What may seem uncomplimentary or damning at this stage may be refuted by testimony later for the defense.

The trial will certainly be long and involved, but, in fairness, everyone should wait for all the evidence before forming opinions about guilt or innocence in the matter.



Letters to the Editor

Time for Computerworld to Correct Letters in Front-Page Masthead

I enjoy reading *Computerworld* and think it is the best weekly DP publication. However, I think it is time the front-page masthead is corrected. I believe the first "O" in the word "Computerworld" is "zero" and the second one is correct. This makes it an "unidentified" word.

Nathan Mark

Elizabeth, N.J.

You're right! And believe it or not, no one here has noticed it in seven years, even though it is now immediately apparent to us. We'll see if the change is noticed when it occurs, but won't say when that will be. Ed.

Unimpressed With Overly Impressed

I have read with much interest the exchange of letters concerning NCR that was originally triggered by Ed Tunstall's comments on the subject [CW, Oct. 15].

To begin with, I am not impressed with anyone who is overly impressed with any computer hardware company. Don Masterson's letter [CW, Nov. 19] was a classic example of someone being firmly in the hip pocket of a hardware company. Masterson has migrated so far with NCR he may just follow them to their grave — or at least get lost in the cemetery.

The reliability of hardware and the quality of hardware service has not generally been one of NCR's major problems. The configuring of hardware has been a problem.

More importantly, NCR historically has not understood the problems of a diversified high-development computer applications environment. An "unpackaged" NCR user will find the going rough, unless things have changed drastically under President William S. Anderson's leadership.

The advice of Masterson to Ed Tunstall to "polish up his resume" is rather typical of the technique that has been used on many DP managers through the years. Hardware companies tell user top management they don't understand why it is having trouble getting results when all of their other users are perfectly happy. Top management in turn tells the DP manager to make the system work or else.

David L. McMonigle

Grand Rapids, Mich.

Why Won't Honeywell Stock Parts?

In the article on Honeywell [CW, Nov. 19], Richard R. Douglas of Honeywell is quoted as saying "Why should we be expected to deplete our field inventory to service noncontract users at the expense of our contract customers?"

I would hope most Honeywell customers would not expect such action on Honeywell's part, but that inappropriate question simply misdirects the reader's attention from the real question: Why won't Honeywell stock parts to support the installed base?

The flow of parts that must come from Honeywell will not change significantly whether a user is under contract or not, and there is probably no user concern about those parts that are readily available from alternative sources.

Honeywell should know the difference. The predictions of parts requirements are better as the base increases. Therefore, the local group should be able to predict its parts requirements more accurately for the entire installed base than for only the contractual maintenance base.

It is difficult to believe the various field offices are forced to order all their parts with 39 to 52 weeks of lead time.

If true, it is a terrible indication of the way Honeywell does business. Regardless, it should not be used as an excuse for equally shabby treatment of customers.

Keeping track of parts requirements and assuring adequate stock is one of the functions for which computers seem to be made. I was even under the impression that Honeywell sold computer systems that performed this valuable function.

I hope anyone considering purchasing a Honeywell system took note of the statements by Douglas and acts appropriately.

L.A. Benton

Del Mar, Calif.

Error Found in Check-Digit Method

In The Taylor Report on Oct. 22, Alan Taylor described the Deeds check-digit scheme. There is an error in the method Taylor used to obtain the check digits. Fortunately, the procedure he used to obtain the check digit for 4321 happened to work for that number. If he used the same method to obtain the check-digit for 789 he would not have obtained a 2.

This is typical of what happens when someone waves his hands at the "esoterics." Great care must be taken when using the tables (Figure 1 and Figure 2 in the Oct. 22 Taylor Report).

Figure 2 is derived from a group multiplication table in such a way as to completely eliminate commutativity (For the nonmathematician, that's interchanging digits). But in so doing, the table is no longer associative.

Generally there are four easy ways to carry out Deeds' method. Perhaps the easiest process would be to place the check digit on the left, say X4321. Now, to find X, use Figure 1 to change 4321 to 1391. Now, applying the table of Figure 2, reduce 1391 to 139 to 12 to 1. Then determine X so that X1 is a 0 in Figure 2. That is, X is 1.

Using this process to obtain the check digit guarantees it works because the scheme to obtain the check digit is the same as the scheme to verify the number with the check digit.

John Beidler

Scranton, Pa.

Letters to the Editor

7090, -94 Users Get Services, Information

I would like to thank *Computerworld* for printing the announcement of our attempt to form a users group for IBM 7090, -94 systems [CW, Oct. 1]. It has so far brought a good response.

Our reason for attempting to form such a group is that first of all, these systems are comparable to 360/50s in performance and are available to educational institutions through the state surplus agencies for $100 or so plus any shipping costs.

Also, sometimes a local industry will be willing to donate one of these older systems.

Secondly, these systems are surprisingly reliable. Our experience has been that, once the mainframe has a chance to settle in, it will go for some months between failures.

Thirdly, when the electronics do fail, they can be easily repaired, and the parts are cheap.

At the moment we can provide technical services and information such as lists of suggested replacement transistors, on-site assistance and machine setup assistance and interfacing to the data channel.

We can also at the moment provide either 7090 Ibsys or 7094 Ibsys and the sources for all the system programs except 9PAC and the old Commercial Translator. We also have the source for Pufft and the Pufft library.

We would like to expand the amount of software available and include other operating systems such as SOS and MAD and would like to find copies of Snobol3, Pilot (a systems language) and Lisp.

We are trying to locate as much existing software as possible because, since Share and IBM have both deleted their 7000 series programs, there is no source left for many of them but ex-users.

We would like, if our group gets off the ground, to form some sort of central library for these older programs.

Terry M. Harris
Terre Haute, Ind.

Avoid Machine Code

Roger Poole asked for reader response on the subject of debugging Cobol programs from core dumps [CW, Nov. 12] D.W. Barron said it perfectly in the March issue of *Computer Bulletin:* "Brown and Sampson remark that humans who gain their livelihood by scouring rubbish tips are not highly regarded by society and suggest that we should regard programmers who grub around in hex dumps in a similar light. Whilst programmers are prepared to be scavengers and are unwilling to develop tools even of a sophistication comparable with a bronze-age axe to help their debugging, do they deserve to be called professional?"

I can only feel that anyone who thinks it is right and natural to go to a machine-code level in a core dump, to debug programs written in a higher-level language (yes, friends, even Cobol is a "higher level language") must be either woefully naive or a terribly poor programmer. Core-dump debugging subverts the entire purpose of Cobol (or any other language above Assembly level).

Yours with some irritation,

Laurance F. Wygant
Chicago, Ill.

High Tide

There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune;
Omitted, all the voyage of their life
Is bound in shallows and in miseries.

The bard is full of good stuff for computer people, including the colloquy between the two terminal operators: "I can call systems from the vasty deep," says the novice. "Why, so can I, or so can any man," says the veteran, "but will they come???"

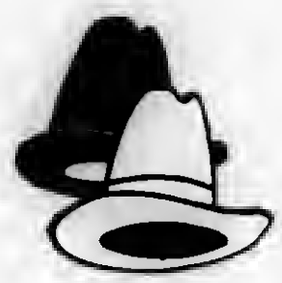
Indeed, it is flood tide in the world of minis and micros; acceptance is high; the peculiar economics of the times is favorable; excitement is peaking. If we do the right things, fortune – financial and professional – lies ahead. But if we steer wrong, the poet's "shallows and miseries" can ground us. The great temptation as the mini revolution matured has been to go the way of the big machines: large word size, complex instruction set, many types of peripherals, a fancy operating system, "maximum" languages such as PL/I. We hear almost daily of minisystems, or to be more realistic, systems made by minimanufacturers, costing $300 thousand or more.

Now we have a second chance, and almost certainly the last: microcomputers. The processor-on-a-chip boys have come along just as DEC and the other early comers stampeded off in the direction of the IBM corral, where they almost certainly will be stamped flat. The users can again insist on simplicity and moderation – on straightforward tools for straightforward tasks.

But microcustomers are usually *novice* users. Their excitement and enthusiasm, played on by the salesman – himself often also a novice, unaware of the ancient agonies of the big-CPU trade – may be punished by a swollen and unbalanced hardware and software package, often requiring as much sophistication in application as a 370.

I sympathize with the manufacturers and their salesmen. Certainly, fancy new hardware capabilities are the most appealing tools with which to increase sales and to enter new applications areas, far more appealing than lower prices or difficult problem-oriented program packages. If sales lag, offer floppy disks, or quadruple the main memory. But I want the user community to resist these seductions. Buy only the simple systems, the small capabilities, the moderate memory. Accept machine language – elementary, few-instruction machine language – coding. Don't pay for megaCobols or PL/1; a good assembler is enough.

It's the last time around, at least for the basic von Neumann pigeonhole-memory computer. If the user community allows microprocessor systems, like their big and mini predecessors, to get all silted up with software, we'll end up with million-byte operating systems in our digital wristwatches. We are lifted on a magnificent flood of new technology; let's stay afloat, and not be grounded in the supersoftware shallows!



Herb Grosch

Interest in Certification Rises

CDPs Could Challenge CPAs on DP Standards Audits

The Taylor Report
By
Alan Taylor, CDP



Another interesting item that came out recently during the data base conference held by the National Bureau of Standards (NBS) and the Association for Computing Machinery was the central position that almost all groups gave to "standards." Of the five groups, four backed standards as being necessary, inevitable, etc. The fifth, Advanced Technology Publications, Inc., was deadlocked on the issue and made no pronouncement in either direction.

But talking about standards without talking about who was to prepare them or to enforce them is like talking in a vacuum.

In the auditing group this subject came up specifically. Speaking for the auditing group, the American Institute of Certified Public Accountants' (AICPA) Donald Adams said it appeared inevitable that the auditors would have to take this role.

Adams also explained both why such a role had been rejected in the past by the auditing profession and why they had changed their attitude.

In the time he had available, he certainly wasn't able to provide a full discourse, but he listed that, among the reasons for prior rejection of such a role, was the possibility of malpractice suits.

The reasons for the auditors now taking the role were, he said, that it was being forced upon them and that the profession was agreeing "kicking, screaming and counting their fees."

20,000 Would-Be CDPs

A few days after the conference, however, another happening came about which perhaps reopened the question as to just what role the auditors are to play in data base and other computer standards.

The Institute for the Certification of Computer Professionals (ICCP) announced that over 20,000 applications had already been received from people wanting to take the 1976 Certificate in Data Processing (CDP) examination. This was double the number who took the examination last year, ICCP said.

This is more than just a numerical jump. It provides clear evidence that the purpose of setting up the ICCP a few years ago is being achieved. Certification of computer personnel on a technical basis is coming and coming with broad backing from the various technical societies.

This makes the auditors assumption that there is a continued vacuum which is forcing them into the position of computer system standards enforcer no longer valid.

With the tremendous support the CDP is now getting from the profession, the standards could be created and enforced by a CDP-based organization. I am not saying it will be – but I am saying that the vacuum no longer exists.

Who Will Serve Best?

What we have to do then is to look at the task of enforcing standards in the computer field to see whether such a task really fits the traditional mold of auditor operations.

Use of the auditors is attractive because of the great service they have already given to commerce and because of the hope that they could give equally great service to computer developments.

Malpractice Issue

Personally, I don't see the auditors really being able to provide service simultaneously in their traditional way and in computer areas.

The clue, as I see it, came in Adam's mention of malpractice. Malpractice in the fast-development areas like DP is most unlikely to be defined in the same way as it is in the centuries-old accounting profession.

Malpractice in accounting is essentially a failure to handle things in accordance with normally accepted standards. The invention of some new, better way of accounting for some item does not make it wrong to continue to use earlier methods.

But in technically advancing areas such as engineering or medicine, for instance, the discovery of an avoidable flow in some accepted way of doing things does make it a matter of professional malpractice to continue working in the old way.

An engineer is always expected to use the latest available information in his profession; the accounting is not. And that difference is crucial.

As I see it, the standards that are coming with regard to privacy, security and other items will require DPers to work like engineers, using the latest available information to secure conformity with standards as we go about our work.

Technical progress will have to come into use just as soon as it is known. And that implies a limited role, at least, for a technical authority such as one based upon certified computer professionals, rather than an exclusively auditor-controlled situation.

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Systems Houses, Clients in No-Man's Land

From a Legal Viewpoint

By Roy N. Freed
Special to Computerworld

Systems houses that buy computers in the OEM market and resell them with applications software, and their customers, are coming to realize they are in a legal no-man's land in regard to protcction against patent infringement and product liability.

This situation has come about because hardware manufacturers supplying the OEM market have failed to take the reasonable and necessary step of simply trying to picture themselves standing in the shoes of their immediate customers and the ultimate users of their hardware. By that default, they have adopted business positions reflected in their "standard" agreement forms that are unrealistic and untenable.

This state of affairs was dramatizcd for me recently when I undertook to handle ncgotiations for an end user directly with the hardware supplier and when I drafted a set of terms and condltions for a systems house. It was interesting to me to see how the two transactions dovetailed to bring to light the common legal problems requiring attention by the hardware manufacturer.

Let me explain the nature of the underlying legal considerations.

Patent Infringement

Every maker, seller and user of a product always runs the risk of infringing someone's patent by virtue of that activity. The rule is that thc owner of a patent may prevent all others from making, selling and using the invention covered by it. The systems house is a seller; its customer is a user. They both have exposure.

Furthermore, Article 2 of the Uniform Commercial Code, which applies in all states except Louisiana, provides that sellers of goods impliedly warrant they are free from infringement. Hence, a systems house that doesn't disavow that warranty in writing effectively makes it and could be held liable for damages lf its customer were sued for infringement.

Moreover, most, if not all, hardware manufacturers include the common provision in their terms and conditions that they will defend their customers, the systems houses, against infringement charges. But they also insist upon the right to recall the infringing items if they are concerned about exposure, on the condition they refund the undepreciated portion of the price paid to them.

Note the situation of the systems house. If the hardware manufacturer demands a competent or complete item back, the systems house literally is under a legal obligation to retrieve it from the user. Can a systems house really assume that exposure?

Is this an entirely academic matter? Although infringement situations don't occur often, they always are possible. Contracting parties that try to do a careful job of providing for worst-case situations cannot ignore that possibility. Wise contracting parties should antlcipatc it and provide for its handling in a fair manner.

It might turn out, upon careful analysis, that thc systems house is an innocent element in the normal channcls of distribution and should be rclieved of involvement so far as infringement by the mere use by the user is concernnd. In that case, the hardware manufacturer should sct up a direct relationship covering the infringement aspect between itsclf and all its end users. This would naturally be limitcd to the equipment and operating system software it furnishes and in the condition in which it furnishes them.

This seems to call for a bit of legal statesmanship and innovation. Of course, the systems house always runs the risk of being an infringer by its act of reselling the equipment and must protect its own exposure in that respect, probably by an indemnification commitment from the manufacturer.

Produet Liability

The same analytical exercise applies to the matter of product liability. Every maker and seller of goods is exposed to legal claims when the goods are defective from users and third persons who suffer harm from them.

The trend is for courts to hold suppliers of goods liable "without fault," which means regardless of the fact they were not negligent in permitting defects to exist in the goods. Although systems houses frequently only resell the hardware they handle, they normally function as systems manufacturers and hence could themselves have significant legal exposure in this respect.

Should systems houses have to buy products liability insurance on the hardware they buy and resell? What is the proper responsibility of the hardware manufacturer in that regard? These are important, entirely realistic questions.

Identified Relationships

The systems house can exclude its infringement liability respecting the resold hardware by a provision in its contract with the end user. That is feasible because only its customer is exposed to harm from an infringement charge.

However, no such easy tactic is available respecting product liability because the exposure runs to people who are not in a contractual relationship with the systems house, such as employecs, visitors and neighbors of its customers.

These two examples show the need for in-depth legal examinations of the identificd realtionships between hardwarc manufacturers and systems houses and between systems houses and end users, as well as the possibly significant but thus far unidentified direct relationship between hardware manufacturers and end users who are customers of systems houses. Skillful attention to the considerations involved will forestall frictions that always are in store. The excrcise represents a typical example of preventive law.

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Concept Applicable Anywhere

Cooperative Effort Builds Ongoing Education Plan

By Don Leavitt
Of the CW Staff

WELLESLEY, Mass. – More than a dozen major DP installations, a college devoted to management training and a personnel-oriented consulting firm are working together on a professional development program of courses for experienced DP staffers in the installations.

The EDP Education Program (Edpep) was conceived two and a half years ago in conversations between Babson College and QED Information Sciences, Inc. Babson has been involved in continuing education programs for management-level people for many years.

QED has been working with various clients helping them define in detail just what it is their DP departments are supposed to be doing, what skills are needed to accomplish those deeds and what training personnel need both to reach those skill levels and to advance their careers.

Training has often been a stepchild in a DP budget – underfunded, understaffed and usually one of the early casualties if there is a financial crunch. Even when there is management support, it is difficult to implement an effective program in-house or to find an ongoing, organized program outside, the planners recognized.

Core Curriculum

Edpep is built around a core curriculum of courses given repetitively at the Babson campus here by outside lecturers supported by college personnel and open to "member" companies.

This provides an ongoing base of funds so Edpep can avoid the cost of public seminars many DP shops find difficult to justify, QED noted.

Satellite courses on specialized topics that may not be suitable additions to the core curriculum but are deemed useful are open to Edpep members and to organizations outside the program.

Peopleware

While QED and Babson put together the original idea, they were careful in the first place to take their thoughts to the major users in the area to see if the ideas meshed with what the users thought they needed.

That philosophy of tuning the program to the user continues with monthly meetings of an advisory council made up of two people from each member organization; a senior DP line manager; and the person in charge of the member's own DP training activity.

In its sessions, the council reviews the very detailed course critique forms each student is required to fill out at the end of a course.

Beyond that, the council reviews course content to ensure each course is "on target" in meeting the needs of the members. It also suggests new courses when needs change enough to require an extension of the program.

Transferable Concept

The concept on which Edpep has been built could certainly be transplanted to other cities, according to both Associate Dean Stuart Stokes of Babson and Ed Kerr of QED.

It has in fact been carried over to the New School of Social Research in New York City, and could be developed anyplace enough DP installations are willing to work together in planning, finding the very best instructors they can and then monitoring the program's progress.

In the Babson-based program, subscribing companies pay a flat fee which entitles them to one seat in each course given during the year; additional seats are available at a somewhat reduced cost. The satellite programs are available to Edpep member companies at a cost less than that charged "outside" firms.

Features of IDS/II Include a Price Tag

WALTHAM, Mass. – Honeywell Information Systems has updated its classic data base management system (DBMS), Integrated Data Store (IDS). IDS/II includes a number of new facilities and something else that is new to IDS users – a price tag.

The original IDS, developed seven years ago, influenced the work of Codasyl's Data Base Task Group in its attempts to define specifications of a generalized DBMS.

Almost ironically, in its current announcement Honeywell said IDS/II "implements recommendations and specifications established as industry standards" by Codasyl.

The IDS/II release includes a data definition language for schema and subschema description. Before the schema is changed, a data dictionary facility added in IDS/II shows those programs affected by the proposed change, Honeywell noted.

Translators for defining data base and media environment and for defining and validating data base subsets as well as runtime data base control routines are included in the IDS update. An integrated control system is said to reduce main memory requirements, ease multiprogramming use of the data base and improve overall performance of the system.

The system was designed to support time-sharing, transaction processing and batch operations, apparently simultaneously. An "Interactive IDS/II" option is required for time-sharing use, Honeywell said.

The Unified File Access System developed for I/O support and buffer management on Series 60/Level 66 CPUs is utilized by IDS/II to support multiple concurrent users.

"Improved data security," including "lock" options at the record level or on use of user-specified verbs, is another of the enhancements in IDS/II, according to Honeywell. On-line recovery facilities apparently are also in the latest version.

Industry sources suggest the updated IDS includes "the full Codasyl privacy and security facilities."

A set of utilities to help users in conventional programming environments convert to IDS/II and another set to help current users reformat files to run under either IDS/I or IDS/II are also in the updated software.

The IDS/II DBMS is immediately available in the U.S. for Series 60/Level 66 and Series 6000 EIS systems with Release 2H of Gcos, the Honeywell spokesman said.

Without noting his words represented a change in policy from the free distribution of the original IDS, he added "monthly charges [for IDS/II] vary with scope and capabilities required."

Basic IDS/II, including the runtime controls, data dictionary, lock procedures and data base administrator support facilities, is available for $400/mo. An optional interface to Cobol is an additional $100/mo and the interactive support is another $75/mo.

'Giant' Supports DEC 310 User

LAGUNA HILLS, Calif. – Users of Digital Equipment Corp. Datasystem 310s or 340s can interactively describe new and existing DP requirements through the use of a "no-programming" file management package called Giant from Second Source.

The user descriptions are posted to control tables by Giant, which then creates a data entry program with Indexed Sequential (Isam) support for accessing records by key, a spokesman said.

On the other end of the DP cycle, report generation modules allow the user to interactively set record selection tests, sort requirements and report formats.

Reformatting of the files, including addition or deletion of fields, is another Giant capability, the spokesman added.

Overall, Giant "promises" to reduce setup time for a new file and its data entry program and reports to as little as one hour instead of the week or two of "normal programming" time, the vendor claimed.

The package is written in Dibol and runs on any DEC Datasystem 310 or 340 – the PDP-8-based Datasystems – with at least 24K bytes of memory.

The software is available for a one-time cost of $1,000 per site. Second Source can be reached through P.O. Box 2749, 92653.

Micro Manipulators Mushroom

•Net Adds Test Bed

DALLAS – Assemblers producing code for various microprocessors and a test bed environment for the output are now on the University Computing Co. (UCC) remote-computing network.

The programming support includes a macro facility.

The simulators can handle the ROM/RAM environment, simulated interruptions and I/O operations and were designed to aid debugging of programs for the Intel 4040, 4004, 8080 and 8008 and Fairchild F8 among others, UCC added from 7200 Stemmons Freeway, 75247.

•PDP-8 Hosts F8 Code

SANTA CLARA, Calif. – A cross-assembler designed to run on a Digital Equipment Corp. PDP-8 and produce programs for the Fairchild F8 microprocessor is now available from Logic Systems.

The package supports shorthand or free-form input and formatted list output. Binary code for the micro is in "Fair-Bug" loader form, Logic Systems added.

The cross-assembler uses 8K of memory in an OS/8 environment and can be acquired for $1,200 from the vendor at 437-A Aldo Ave., 95050.

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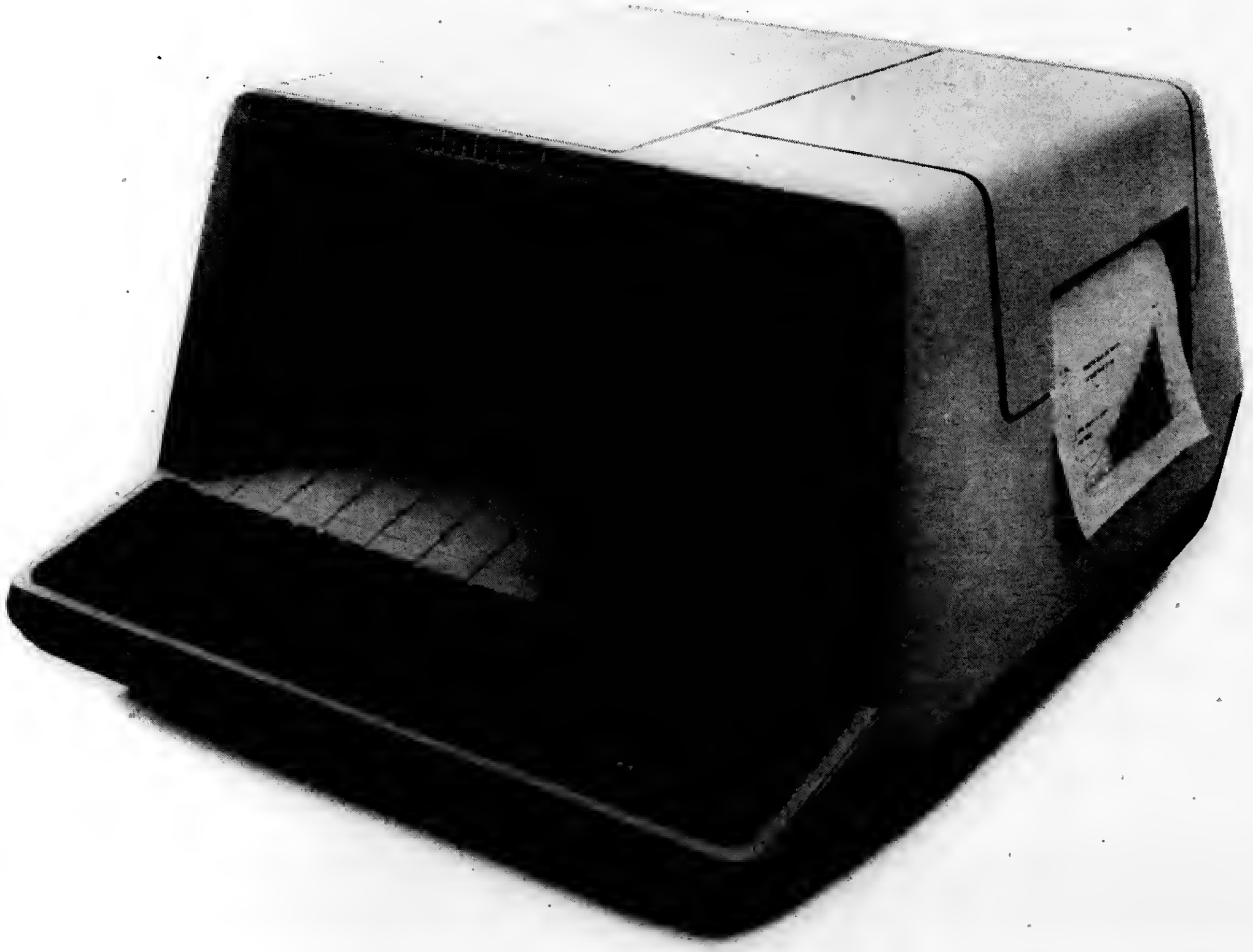
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'Easytrieve' Tied to Total DBMS

OAK BROOK, Ill. – Users of either DOS or OS Easytrieve from Pansophic Systems, Inc. can work with the Total data base management system from Cincom Systems, Inc. through a separately priced Total Option package now available from Pansophic.

The option package "is more than an interface" with the data base system, a Pansophic spokesman claimed. Besides allowing Easytrieve to access Total files, it includes a Data Selection Feature that "significantly" reduces overhead when processing information from Total.

Although many retrieval packages have been interfaced with Total, they typically require everything in the data base to be passed to the report generator for record selection, the spokesman said. Easytrieve's approach is to select records or fields before they are passed to the report function, he explained.

The Total Option to Easytrieve is available on a perpetual basis for $5,000, but maintenance after the first 12 months is $300/year. Easytrieve itself can be acquired for $12,500, with $750/year for maintenance, if desired, after the first year.

Pansophic is at 709 Enterprise Drive, 60521.

Retail Shops Backed By On-Line's 'Pure'

PITTSBURGH, Pa. – Chain-store retail organizations can gain better control over acquisition and distribution of merchandise with the Purchasing and Receiving (Pure) system now available on the On-Line Systems, Inc. remote-computing network, an On-Line spokesman said.

The system handles replenishment of staple items as well as one-time purchases of fashion or seasonal goods, he added. Purchase orders are generated and sent to vendors as needed items are entered and authorized by open-to-buy or merchandising management.

Upon receipt from vendors, shipments can be checked against purchase orders and against manufacturers' invoices. Status reports generated by the system keep buyers posted on open orders, overages, shortages and substitutions.

Pure is available through teletypewriter or CRT terminals in user offices linked by local dial-up phone lines to On-Line offices in 15 metropolitan areas.

Headquarters for On-Line Systems is 115 Evergreen Heights Drive, 15229.

$3,000 CDC-Oriented Routine Speeds Complex Curve Fitting

PITTSBURGH, Pa. – Curvfit from Cyber Associates, Inc. is described as a very high speed, general curve-fitting utility for use with Control Data Corp. CDC 7600 and 6000 series CPUs.

The routine is Fortran-CALLable and allows unpacked matrices, solving M equations in N unknowns where M is greater than N, the vendor claimed. Curvfit accepts one equation at a time, building the matrix, and performs a least-squares-solution when all rows have been processed.

Iterative use of Curvfit allows solutions of nonlinear systems through use of partial differential equations and evaluations of the function difference at each step, a Cyber spokesman added.

Written in Compass – the CDC Assembly level language – the Curvfit coding runs in 60 words of CDC 6000 memory and costs $3,000.

A large matrix version of the software for Extended Core Storage or disk-based matrices, in which the user need not concern himself with direct manipulation of intermediate storage, is available for $4,000.

Cyber Associates is at 3508 Fifth Ave., 15213.

XCS Aids Distributors

LOS ANGELES – Distributors with little or no DP experience will be able to manage order entry, billing, inventory, credit and sales analysis with the Xerox 1-2-3 system now available on the Xerox Computer Services (XCS) remote-computing network.

Designed to be price-competitive with some of the smaller in-house computer systems now available, Xerox 1-2-3 can be driven from a teletypewriter terminal in the user's office.

Large volume output can be directed to remote printer facilities in the nearest XCS sales offices for overnight delivery, the vendor said.

Each order entry, inventory or accounts receivable transaction entered at the terminal is posted to all appropriate ledger files. These in turn are then available for information retrieval, including the most current entries, allowing the user to create optimal balances between stock levels and customer service.

For credit management, the system provides current customer status, delinquency statements, detail and summary aging reports. It also checks each customer's credit limits during order entry and simultaneously determines if inventory is sufficient to fill the order, the vendor said.

Sales management provides current month and year-to-date sales and gross profit contributions by customer, product and sales territory – or any combination of these parameters.

Stressing the idea that "any employee with a thorough knowledge of the company's business" can work with Xerox 1-2-3, the network provides "hands-on" operator classes.

XCS is headquartered at 1510 Beethoven St., 90066.

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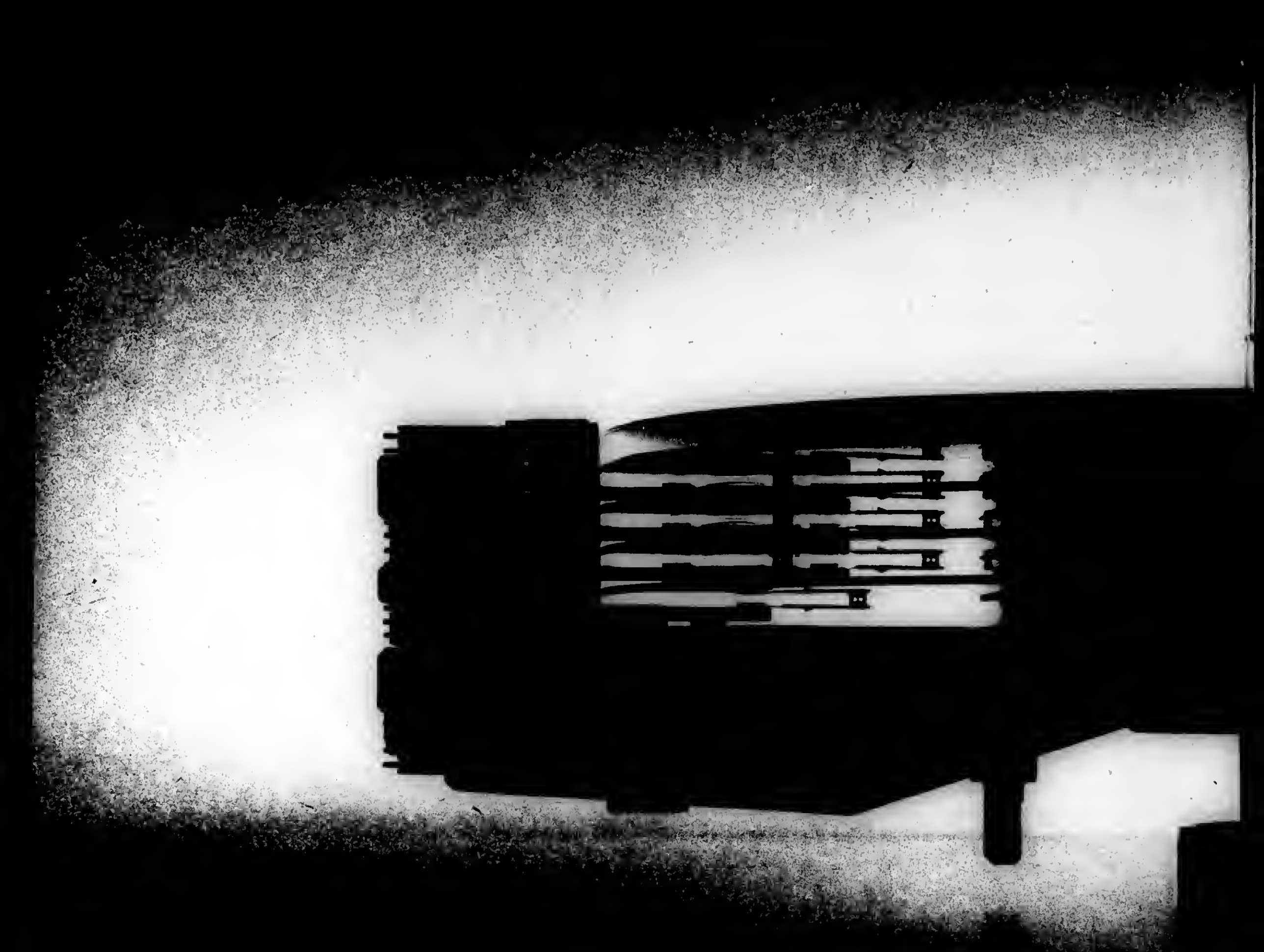
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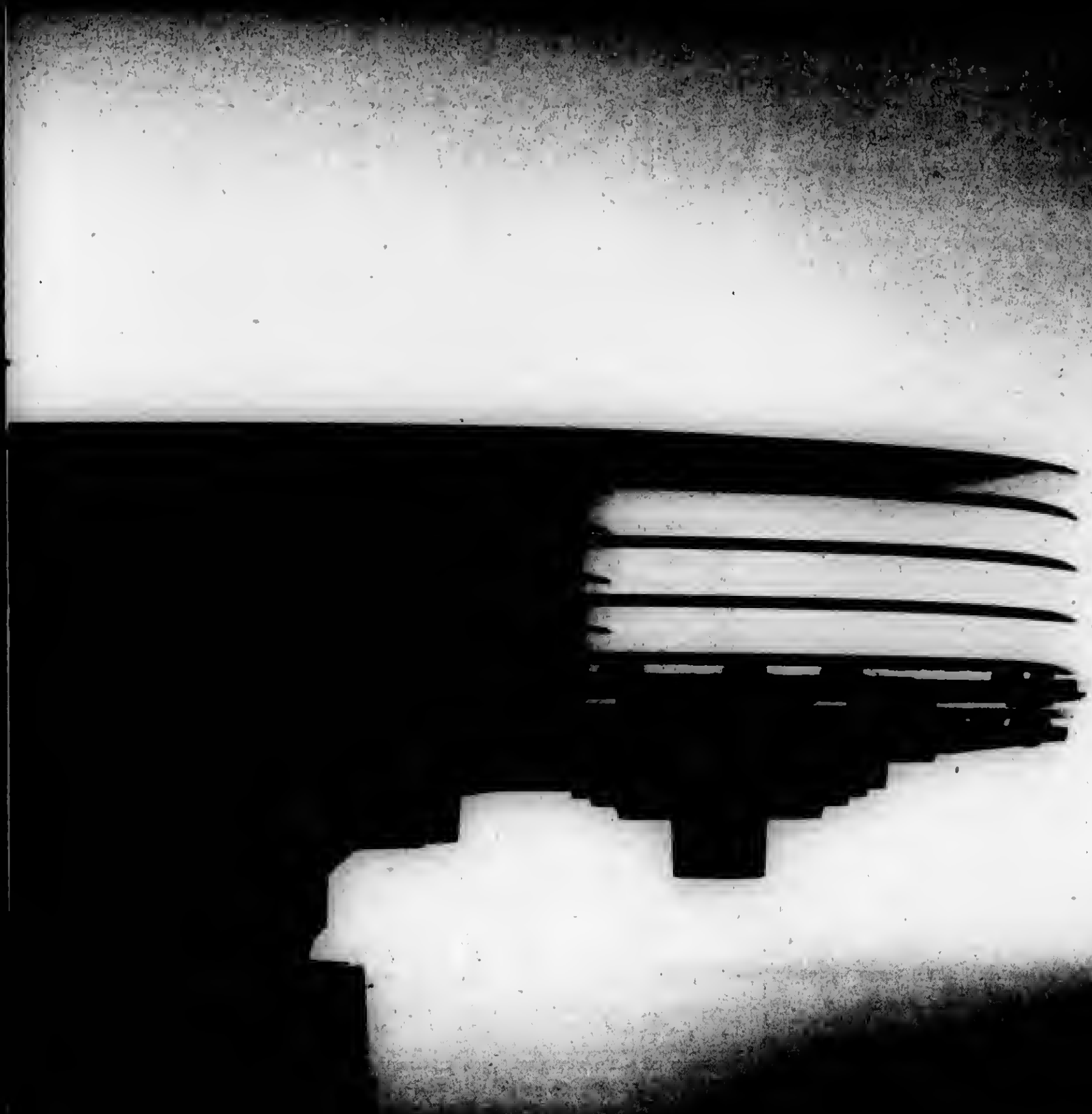
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MEMOREXCELLENCE

TA Can Ease Programmers' Communication Problem

By Gerry Richardson
Special to Computerworld

This article is not meant in any way to imply that DP people have not "arrived" at the professional level. Most of the people I have talked with are definitive professionals of the highest order.

However, in researching the field over the past few years for the purpose of isolating specific areas where improvement was needed, I concluded the ability to communicate *verbally* is grossly lacking in the profession. By their very nature, DP and systems people are thoroughly rational, logical and unemotional; the business almost forces them to be. They almost become part of the electronic "creatures" they tend.

In the broad perspective, working in DP or systems analysis calls for:

- Input – The gathering of sufficient data through research or interviews.
- Processing – The bringing together of the gathered data in order to create a program or system which will hopefully meet the need(s) of the user(s).
- Output – The "selling" of the implementation, installation and/or funding of the program, system or "black box," once it is completed, by convincing the proper authorities that such is warranted on the basis of utility and the savings of money or time.

My research indicated DP and systems people were an unqualified success at the processing procedure, but more often than not (mainly because of a lack of understanding of the verbal communications process) were abject failures at the input and output processes.

Obviously, the interview or information-gathering process is crucial to the success of the program or system. Perhaps not so

Peopleware

obvious is the fact that the most sophisticated and progressively fantastic program or system ever developed is totally useless unless it is "sold," funded, installed and properly maintained. It will sit on the shelf and gather dust.

This usually happens when the programmer or analyst is more interested in self-esteem than implementation. Common messages communicated but not spoken to the user in this case are "Look how great I am!" or "What would you do without me?"

TA Training

Thus, based on a perceived need for training in these areas, we at Richardson Associates created the seminar we call "Verbal Communication for Systems and EDP Personnel."

The basic training model is based on a nonpsychotherapy application of transactional analysis (TA), a little-known area of the behavioral sciences which was popularized by Thomas Harris in his book, *I'm OK, You're OK: A Practical Guide to Transactional Analysis.*

In the TA view, everyone is recognized to be three different people – Parent, adult and child. Each entity is called an ego state and should be used with full facility in a psychologically healthy person.

The parent in each of us is stern, accusing, forbidding, blaming and critical or soothing, consoling and nurturing.

The child in us is obedient, intuitive, fun-loving or rebellious. The adult part of our personality is rational, logical and unemotional.

The simplicity of explanation about the training model provides the seminar participant with a concept of how to deal with the people *within* the system or program. In other words, too often a programmer or analyst will consider only the program or system as an entity without giving much thought to the people who will be affected.

In addition, an operative clash often occurs between management and EDP systems people. The principle behind this clash is that management is basically the critical parent in orientation while DP and systems people are far too adult. Rationality, logic and a pronounced lack of emotion does not mix well with the managerial parent role which filters from the top down.

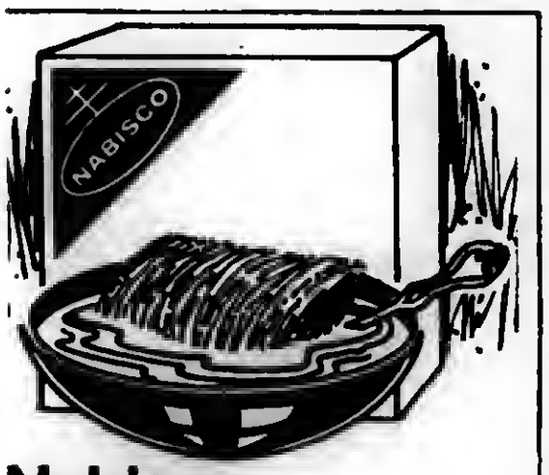
The result of this interface is that the DP or systems person is often thought of as a necessary evil which must be tolerated ("After all, we bought these electronic monsters to show our stockholders that we're modern and up-to-date, but we don't have to like those wierdo's who run 'em!" I would be interested in knowing how many readers have either heard or felt that phrase before).

Legitimate Questioning

The premise of such training is generic to the fact that most people assume that, given a mouth, a brain and a 1,500-word minimum vocabulary, we know how to communicate. Yet we still have wars, murder, rape, divorce and suicide. Therefore, we can begin to legitimately question our communicability.

In the communications process, problems occur because we have not even been taught how the "pieces" move or fit together. Thus, when someone makes a mistake in talking to another person, either one or both walk away with bad feelings which are altogether unnecessary.

Richardson is president of Richardson Associates, Los Angeles-based consultants in the behavioral sciences.



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Cross-Assembler for Intel Executes on 16-Bit Minis

WALLINGFORD, Conn. – Another cross-assembler supporting development of programs for the Intel 8080 microprocessor through use of a bigger machine has been introduced.

The Mycro-Tek assembler from Northeast Services, Inc. is written in ANS Fortran IV and is said to execute on any 16-bit machine with that language capability.

Accepting user programs written in 8080 Assembly language, the package generates an assembled program listing and a hexadecimal object tape compatible with Intel's MCS-80.

The cross-assembler is designed to run in 10K and does not use disk. It is available for $300 from Northeast at 34 Highland Ave., 06492.

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COMMUNICATIONS

From Users Surveyed by Datapro

Harris Batch Terminals Win Top Performance Ratings

By a CW Staff writer

DELRAN, N.J. – Remote batch terminals from Harris Corp. were rated highest in overall performance by respondents to a recent user survcy.

Batch terminals supplied by Data 100, Datapoint and Computer Machinery Corp. (CMC) also outscored those of IBM, according to the survey donc by Datapro Rcsearch Corp.

The survey drew responses from 294 users with a total of 1,525 installed batch terminals. The users were asked to rate their terminals' overall performance, ease of operation, hardware reliability, maintenance service and softwarc and technical support.

Twelve types of batch terminals were rated by 10 or more users each. On a scale ranging from 1 for poor to 4 for excellent, Harris scored 3.6; Data 100, 3.5; CMC/Remcom and Datapoint, 3.4; IBM and Mohawk, 3.3; Singer/M&M and Sycor, 3.2; Burroughs, 3.1; Four-Phasc, 3.0; Univac, 2.9; and Control Data Corp., 2.7.

Harris was also rated highest by users in software and technical support and shared top honors for maintenance servicc with Singer/M&M. CMC/Remcom terminals were rated highest in ease of operation.

Data 100, Datapoint, Harris and IBM wound up in a four-way tie for the top position in hardware reliability.

Private voice-grade lines were used by 50% of the respondents, while 38% used dial-up telephone lines and 12% used other facilities.

The most popular transmission speed was 4,800 bit/sec, used by 43% of the respondents. Twenty-two opcrated at 2,400 bit/sec, 19% operated at 9,600 bit/sec and 15% opcrated at 2,000 bit/sec.

Ebcdic transmission code was used by 74% compared to 21% for Ascii and 5% for all other codes. Binary synchronous line protocol was the choice of 85% of thc users, compared with 11% for Ascii and 4% for others.

IBM Host With Most

Most of the host CPUs in the users' networks werc supplied by IBM, with almost 40% having a 370/155 or larger machine. Twenty-two percent had CPUs that included machines in the 370/115 to 145 range.

Five percent had CDC mainframes, 7% had Univac systems and 4% had Burroughs hosts. Two percent of the CPUs in the survcy came from Honeywell.

The major application was described as "dcdicated batch," with 78% of thc users chccking this category while 10% said they operated key-to-disk data entry applications on their terminals.

Thc most popular terminals cmulated by users was the IBM Hasp station with 121 responses while 86 said they operated in IBM 2780 mode. Others mentioned werc CDC 200 User (29), Univac 1004 (27) and Univac DCT 2000 (5).

In the network configuration category, 91% operated point-to-point systems while only 8.9% had multipoint nets.

The survcy results are available for $10 from Datapro at 1805 Undcrwood Blvd., 08075.

Error Rate Low For Tran Data Set

EL SUGUNDO, Calif. – A synchronous digital data set that is said to reduce transmission error and impulse noise has been introduced by Computer Transmission Corp. (Tran).

The Intertran-2 data set operates with transmission error rates of onc error in 10^8 bits transmitted. Its characteristics make the Intertran-2 data set "ideal" for local data distribution between terminals in educational, research and manufacturing campus-like environments where line lengths from 2 to 7 miles can be used, according to the company.

The unit transmits digital data over nonloaded unconditioned cable pairs or private lines. It has an EIA RS-232C/CCITT V.24 interface with operator-selectable data rates of 2,400-, 4,800- and 9,600 bit/sec.

The data set can interface to most data terminal equipment with its EIA interface and is described as transparent to data formats or patterns.

The digital unit eliminatcs all analog conversions and can transmit over four-wiré, twisted-pair (19 to 26 AWG) private line or cable pairs provided by a common carrier.

While the basic operating mode is full-duplex for maximum throughput, the Intertran-2 data set can also operate in half-duplex mode.

Two diagnostic tools are included in the data set. One, a logic loopback, is used to check the line and the remote set. Line loopback is also availablc for testing the local data set.

Loops beyond the normal operating range of the Intertran-2 set use two data sets, one as a repeater for the link.

Purchase price for the Intertran-2 data set is $685. Tran is at 2532 Utah Ave., 90245.

Regulation Hit for Favoring Big Business

By Ronald A. Frank
Of the CW Staff

BOSTON – Recent regulatory trends "appear to be supporting the interests of big business and vested interest groups . . . directly damaging the small business man," Minor Huffman Jr. said here recently.

Huffman, who is president of the Center for Communications Management, Inc., a research firm, said in the past three years most small- to medium-size users have experienced an increase in communications costs of over 30% while the boost for big business, which enjoys bulk discounts, has been less than 10%.

The Federal Communications Commission's policy of competition in the private line area has created a situation where the smaller user will have to subsidize the large user, the government and the specialized common carriers, he said.

As a solution, Huffman proposed raising private line rates to a point "sufficient to protect" dial-up and Wats rates. This would correct the discriminatory rate structure which favors big business, he said.

He called for future rate increases to be equally applied to all types of business users and a moratorium on issuing operating permits to new specialized carricr applicants.

Huffman also suggested a special use fee on all private line facilities and an "inverted pricing schedule for peak hour phonc traffic" such as that used by power companies. The latter would allow the smaller user to escape having to support a phone network designed to accommodate the "very large business telecommunications users," he said.

While the small- to medium-size business organizations are not presently as vocal as their big brothers and do not enjoy thc support of the self-appointed "consumer advocates," they deserve better treatment than they are now getting, Huffman said at the recent annual conference of the National Association of Regulatory Utility Commissioners.

Controller Allows Wang 2200 To Emulate IBM 2780 Format

TEWKSBURY, Mass. – Wang Laboratories, Inc. has introduced a telecommunications option which allows Wang 2200 computers to communicate with IBM System 370s and other host CPUs as an IBM 2780 remote batch terminal.

The Model 2228 communications controller initially supports binary synchronous communications discipline with the Ebcdic character set at speeds of 2,000-, 2,400- and 4,800 bit/sec on a dial-up basis. All transmission control, including error checking and retransmission, is handled by the Model 2228 hardware.

Emulator Program

The communications controller comes with a terminal emulator program which loads the microprocessor, allowing the 2200 to emulate the communications protocol of an IBM 2780 terminal.

A Wang configuration with the Model 2228 can therefore communicate with an IBM processor as a remote batch workstation with "no changes" to the supporting 370 teleprocessing software, the company said.

Equipped with the Model 2228, the Wang 2200 retains all of its stand-alone processing power, Basic language and peripheral capabilities and adds the ability to operate within the IBM communications environment.

The Model 2228 communications controller is priced at $2,500, including the terminal emulator program, with rental and leasing plans available. Delivery is four weeks from 836 North St., 01876.

T-Bar Has Transfer Switch

WILTON, Conn. – T-Bar, Inc. has a switch that can bc used to transfer CRT terminals, such as the IBM 3270, between differcnt controllers.

Designed to reduce the time required to restore a terminal to service in case of a controller channel fault, the switch comes in eight-channel or 16-channcl versions. Both the signal conductor and the shield of the coaxial circuit are switched simultaneously.

The Model 5181 for eight channels costs $800 while the Model 5182 for 16 channels costs $1,200 from T-Bar at 141 Danbury Road, 06897.

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Teletypewriters Replaced

Dealership Net Finds Terminals Solution to 'Data Lag'

By Peter Granson
Special to Computerworld

DAYTON, Ohio – Reynolds and Reynolds Co. (R&R) has added data terminals to its automated dealership accounting system.

Subscribing dealers who selected the Texas Instruments Silent 700 programmable terminal over the traditional mechanical teletypewriters are now able to edit input data locally, perform preprocessing and subsequently transmit and receive critical decision-making information between their dealerships and the firm's regional processing centers.

The automated dealership accounting service evolved from an adding machine type of input to a system consisting of a network of teletypewriters tied together by six regional polling centers equipped with Burroughs B4700 computers. Clerks at individual dealerships entered daily operating data into a mechanical teletypewriter from standard forms.

At night, each processing center collected data from terminals in its region over telephone lines. The regional computer would edit and format the data and subsequently generate accounting records and a daily operating control (DOC).

The accounting records were then mailed back to the dealer and the DOC was transmitted daily via telephone lines. The mailing of accounting records to dealerships was causing some unwanted "data lags" in the system.

Prompted by this situation, R&R set out to find a method for reducing overall data communication cycle time. And, after considering several options, it decided to replace existing mechanical typewriters with Silent 700 Model 742 programmable data terminals.

Terminal Transactions

"Our concern was that the automobile dealer was not able to obtain a reliable, inexpensive terminal to fill his data communications needs," according to Arnie Cantrell, director of marketing for R&R's DP division.

"With the Model 742 terminal, that need has been fulfilled," he said.

Dealers using the programmable model can transmit and receive data at 120 char./sec and generate hard-copy output at 30 char./sec. This terminal capability between dealer and regional centers has eliminated the data lag problem and increased printing and data transmission rates.

Monthly line costs were reduced through increased line throughput.

In addition, dealerships using the programmable terminals realized a number of other advantages. The Model 742 automatically performs field checking, range checking and zero balancing of general ledger accounts (source editing) locally, which means there is essentially error-free data entry.

Also, blocked transmission protocol in which data is transmitted in 425-character blocks provides a checking scheme to ensure correct data is sent between each Model 742 and R&R's regional processing centers. These two features alone result in better line utilization and a corresponding reduction in line costs.

Operator training and data entry time are simplified because of the programmed lead-through procedures. The thermal printing used by the terminals reduces office noise levels.

R&R has noticed an improvement in overall reliability which keeps maintenance requirements to a minimum.

Granson is product coordinator for accounting marketing at Reynolds & Reynolds Co.

IDS Modules Aid Control Center Design

PROVIDENCE, R.I. – International Data Sciences, Inc. (IDS) has introduced the Series 8900 Minitech modules which incorporate a modular approach to the design of technical control centers.

Plug-in modules provide front-end processor switching plus patching and monitoring for the 25 lines at the EIA interface and the four lines at the telephone line analog interface, IDS said.

Sixteen channels of switching along with a controller and power supply are housed in the system. The push-button magnetically latched switches, which IDS said are immune to power failure, can switch a single channel or simultaneously switch an unlimited number of channels through a chaining feature.

In addition to A-B switching, the modules provide a 25-wire monitoring port, continuous LED indication of receive data, transmit data and data carrier detect signals and a 25-wire channel-to-channel patching capability.

Analog switching, patching and monitoring capability is provided by the Model 8904 16-channel (four-wire) full-duplex analog patch and monitor module packaged in one rack-mounted panel.

A 16-channel EIA system is priced at $4,175. The 16-channel analog system is priced at $650. IDS is at 100 Nashua St., 02904.

SSC Has Programmable Interface

SALT LAKE CITY, Utah – SSC Corp. has introduced a programmable interface for message switching and communications formatting which can be used in digital interfacing applications.

Particular applications include speed conversion, mode conversion, code conversion and data routing, SSC said.

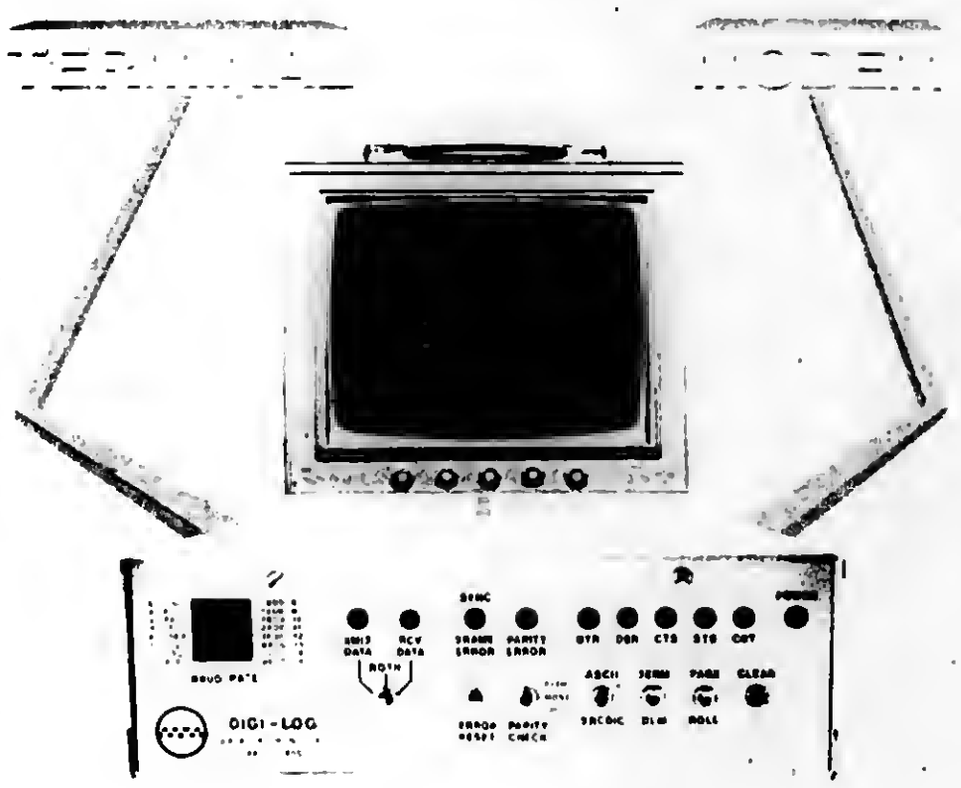
The unit can be used in various combinations of asynchronous and synchronous applications. Multiline data routing functions, such as message concentrating, line monitoring and terminal multiplexing, can also be handled.

The unit features a microprocessor as its programmable control unit. Scrial inputs and outputs meet EIA RS-232C standards.

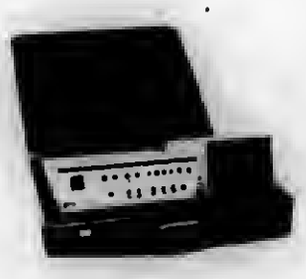
Price including initial program is $2,200. SSC Corp is at Research Road, 84112.

FAULT ISOLATOR

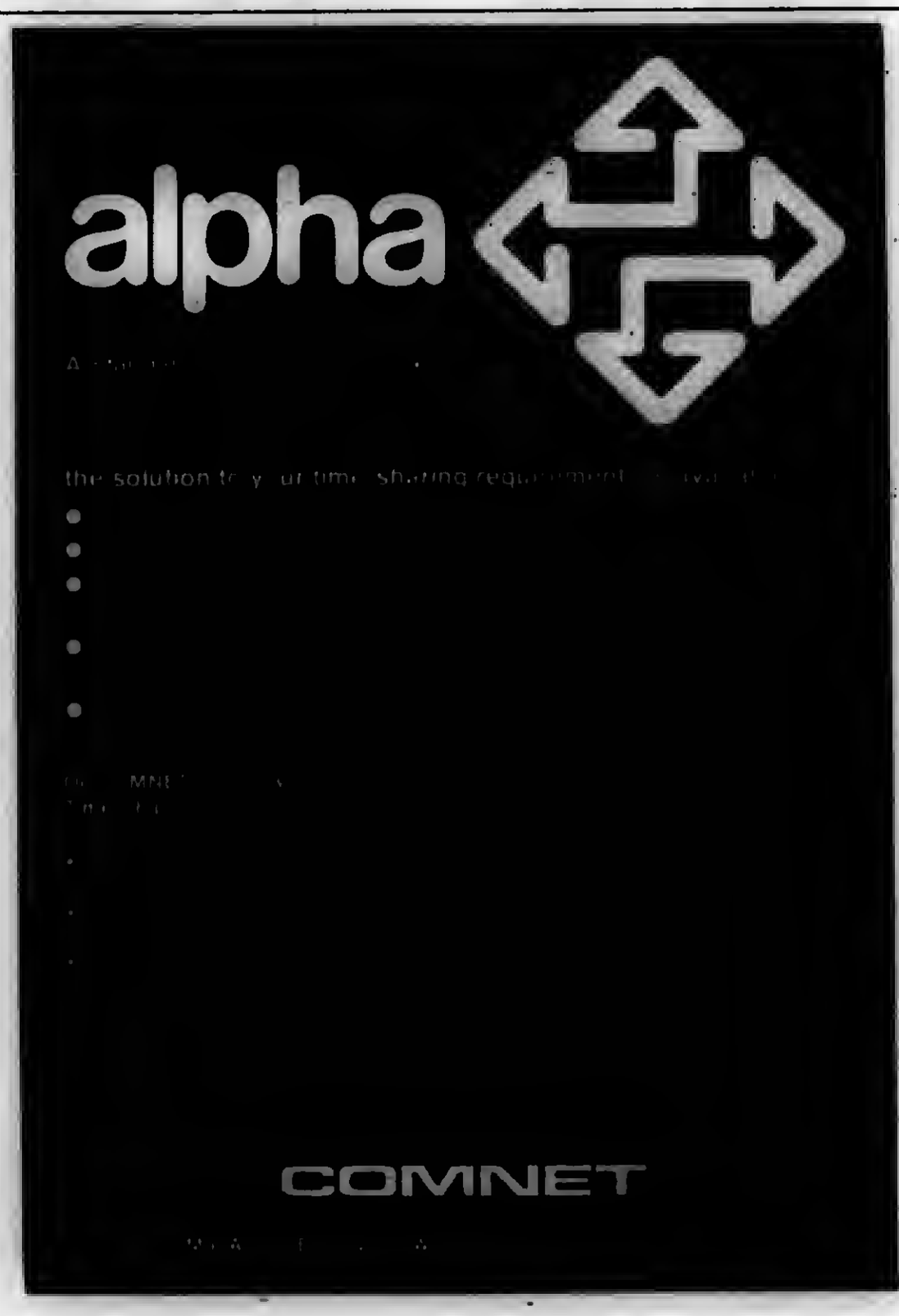
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Photographed on location in Miami Beach, Florida.

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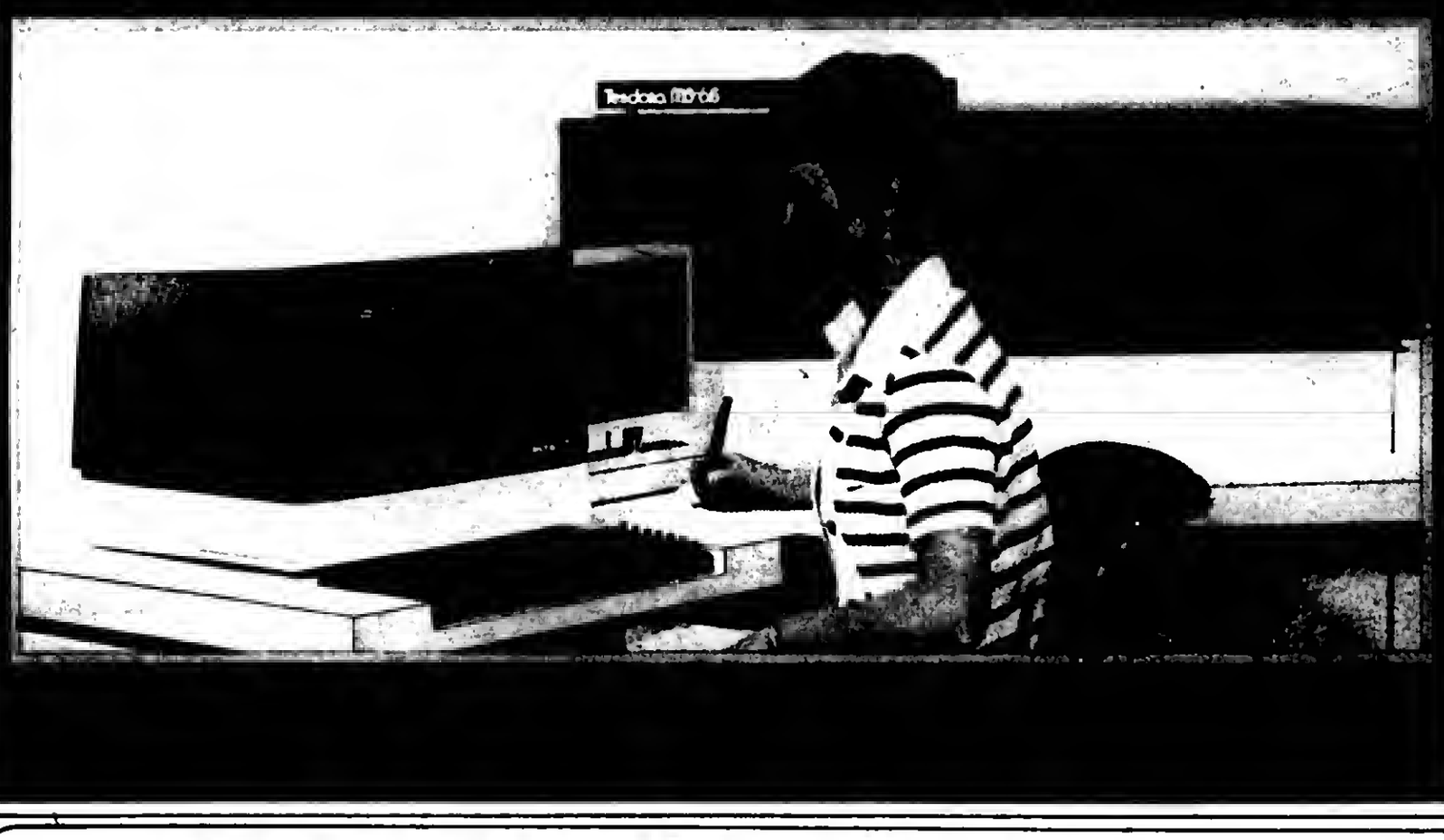
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Epoch 4. It's one winner that'll give you a great run for your money.

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N.Y. Bank's Network Based on Four Minis Has Worldwide Scope

NEW YORK – A message-processing system with a potential for speeding global transmission of data at electronic speeds has been introduced by Citicorp.

Called Citiswitch, the system links the head office of Citicorp's main subsidiary, First National City Bank, with main branches throughout the world. By year-end the communications network will include over 40 locations in New York and 78 overseas.

The system, made up of four minicomputers including backup equipment, automates the paper and the labor-intensive wire and cable units located at 111 Wall St., where most of the message traffic for Citicorp was received over teletypewriters for internal routing via facsimile and messenger service.

No More Long Waits

Before Citiswitch, it was possible for a message to take hours to reach its destination because of the multiple handlings involved. The manual process involved tearing the message off the receiving unit, stamping, checking, sorting and often delivering it to another building where it was sorted, sent through the bank's pneumatic tube system, picked up, logged and finally routed to the addressee.

With Citiswitch, the message is entered via CRT intelligent terminals and routed to its final destination electronically. The message is printed at a terminal located near the addressee.

The electronic signal is brought directly to the computer and structured messages can be accepted and processed at once.

If a test word is necessary as part of the message, the system passes it over to computers at the Message Diagnostic Center (Medic), which encodes the test word according to data entered in the "message header," the first five lines. Messages that cannot be routed by the switch are passed over the Medic, where an operator can look at the message on a display screen and alter it as necessary.

By year-end, it is anticipated that the system will be processing over 20,000 messages per day.

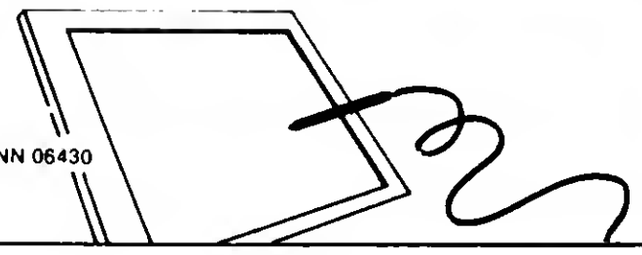
Telenet Adds Centers, Increases Total to 16

WASHINGTON, D.C. – Telenet Communications Corp. has added nine switching centers, increasing the number of central offices in its nationwide public data communications network to 16.

The Telenet central offices are located in Atlanta, Cleveland, Detroit, Houston, Minneapolis, St. Louis, Pittsburgh, Philadelphia and Newark.

More than 15 customer host computers were connected to the network in the first three months of service, according to Telenet.

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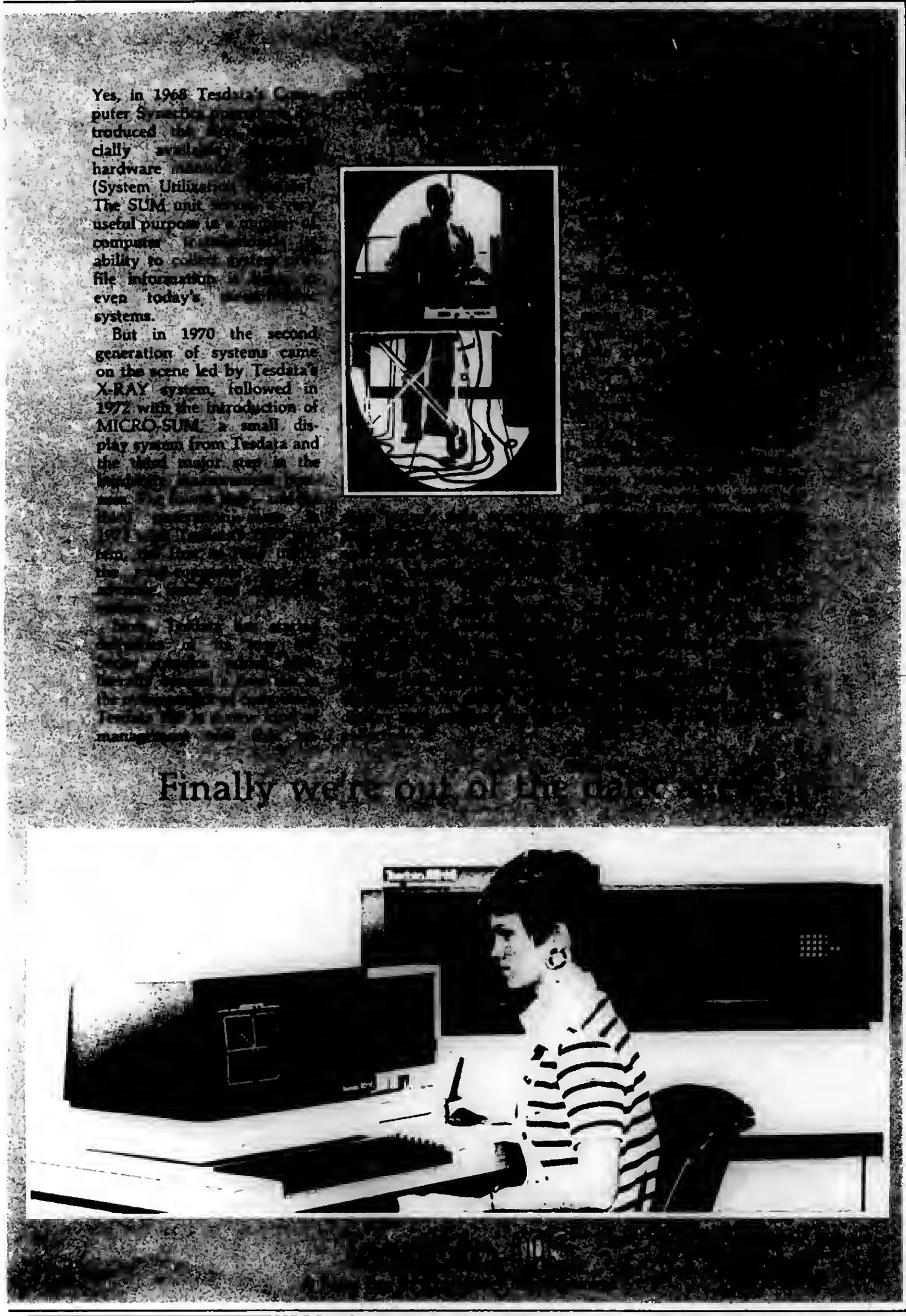
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N.Y. Bank's Network Based on Four Minis Has Worldwide Scope

NEW YORK – A message-processing system with a potential for speeding global transmission of data at electronic speeds has been introduced by Citicorp.

Called Citiswitch, the system links the head office of Citicorp's main subsidiary, First National City Bank, with main branches throughout the world. By year-end the communications network will include over 40 locations in New York and 78 overseas.

The system, made up of four minicomputers including backup equipment, automates the paper and the labor-intensive wire and cable units located at 111 Wall St., where most of the message traffic for Citicorp was received over teletypewriters for internal routing via facsimile and messenger service.

No More Long Waits

Before Citiswitch, it was possible for a message to take hours to reach its destination because of the multiple handlings involved. The manual process involved tearing the message off the receiving unit, stamping, checking, sorting and often delivering it to another building where it was sorted, sent through the bank's pneumatic tube system, picked up, logged and finally routed to the addressee.

With Citiswitch, the message is entered via CRT intelligent terminals and routed to its final destination electronically. The message is printed at a terminal located near the addressee.

The electronic signal is brought directly to the computer and structured messages can be accepted and processed at once.

If a test word is necessary as part of the message, the system passes it over to computers at the Message Diagnostic Center (Medic), which encodes the test word according to data entered in the "message header," the first five lines. Messages that cannot be routed by the switch are passed over the Medic, where an operator can look at the message on a display screen and alter it as necessary.

By year-end, it is anticipated that the system will be processing over 20,000 messages per day.

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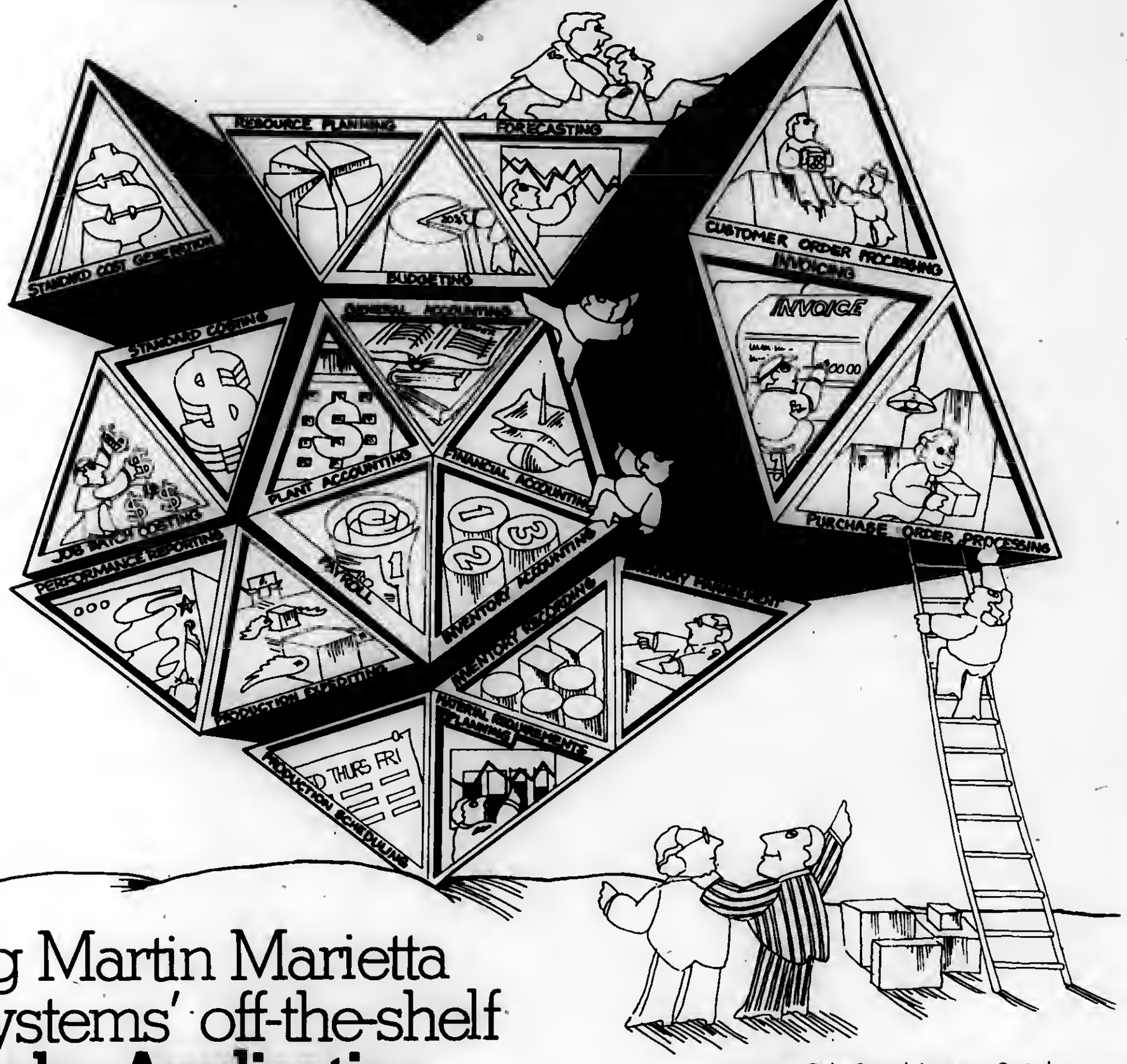
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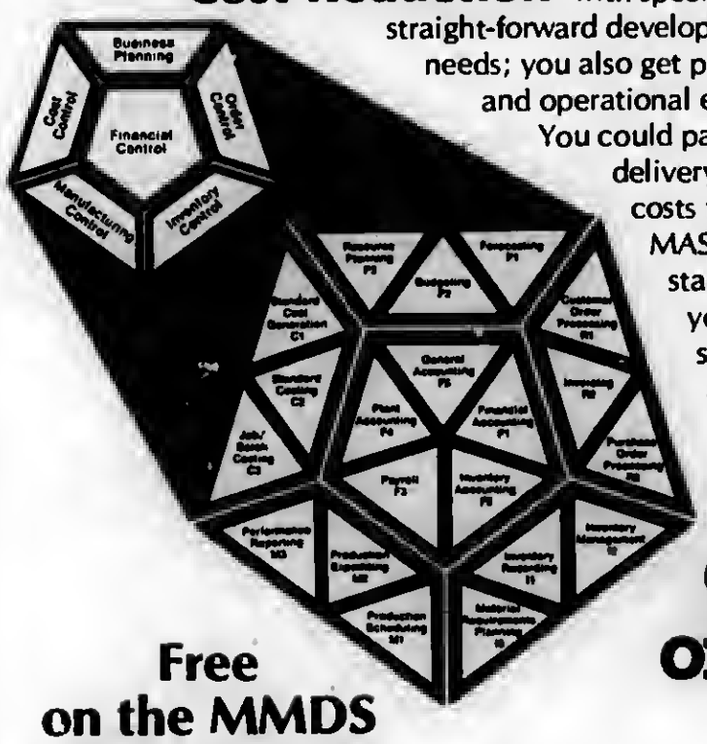
SYSTEM	ELEMENTS IMPLEMENTED	"STANDARD" MAS DELIVERY	"CUSTOMIZED" MAS DELIVERY
		Weeks	Weeks
Inventory Control	170	3	16
Cost Control	25	2	10
Order Control	34	2	10
Manufacturing Control	60	2	12
Financial Control	176	3	15
Business Planning	45	2	10
	510	2.3 Average	12 Average

performance honed to a fine edge

failure to produce results, subsequent temperamental behavior. The MMDS MAS range was built in 1967/1968, with a completely new Version 2 released in 1972/1973. You know the systems will work; that they'll produce the results; and that the anticipated interaction will be there when you want it. You know the input documents are usable, the controls extensive and the reporting responsive to your needs. And you know the systems performance has been honed to a fine edge in the 500 implementations; the customizing facility giving nothing away in performance or fit.

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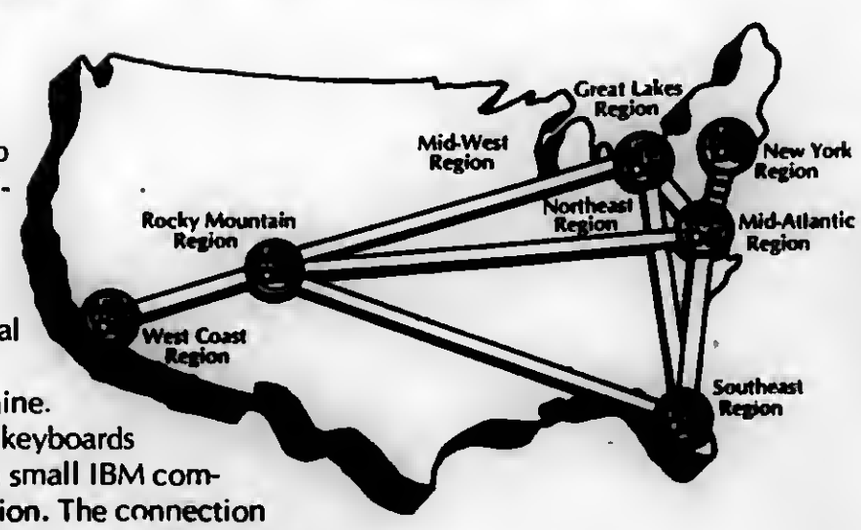
You get the exact system you specify, with special internal structure to permit straight-forward development in line with your business needs; you also get proven, demonstrable performance and operational efficiency honed to a fine edge. You could pay a lot for that sort of assured delivery and pay-off. Home built code costs typically $6 to $10 per statement. MAS code goes at $1 per statement, standard. If you want it customized, you might push this up to $2 per statement. An 85% to 90% savings at best. Highly customized: a 65% to 80% savings. For systems that are better than home built, and can be delivered tomorrow.



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Martin Marietta Data Systems Martin Marietta Data Systems builds and runs computer systems: custom systems and off-the-shelf MAS. Our emphasis is on providing well thought-out products and services in a reliable and economic fashion. Our RJE terminal service, the 370/168 computer centers and linking network, and the MAS product ranges are all directed to this end. We seek the best people in the computer services industry and we provide them the tools with which to do an efficient job. These software tools and methodologies are proven commercial successes in their own right—SDM, a Systems Development Methodology; Testmaster, a modular programming test harness; Tablemaster, for decision table processing; and HSL 1; a systems analysis language.

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Changing IBM Protocols Create User Fears About Independents

By Patrick Ward
Of the CW Staff

TORRANCE, Calif. – "IBM's changing communications protocols do not make it hard for an independent to design a front-end processor, but they do create a fear on the part of the end user as to whether that independent can retain compatibility with IBM."

Raymond E. High, president of Computer Communications, Inc. (CCI), a front-end vendor here, said field upgrades can handle the hardware implications of IBM's Synchronous Data Link Control (SDLC) quite easily.

"The hard thing is to get a clear definition of SDLC so you can sit down and make sure you're going to be compatible," added Bud Bailey, vice-president of marketing.

"It's like trying to kick a field goal when somebody is moving the goal post," High added.

"As for IBM's Network Control Program (NCP), intelligent, minicomputer-based front ends can be programmed to deal with this software," High said.

CCI builds its CC-80 programmable front-end processor with up to 512K of programmable MOS memory. The company supplies the same system to Memorex Corp. which repackages it as the Memorex 1380.

Trend to Networking

As CCI sees it, the trend in DP is "definitely toward networking and distributed processing," Bailey said.

"IBM has signaled this by putting intelligence into its remote terminals.

"The full implementation of these concepts will probably come in the latter part of the decade," he predicted.

"As long as the 370 is around, you're going to need front ends to take overhead from the mainframes," he said.

However, "there is a countertrend toward putting the front end right into the mainframe, as Burroughs is doing on some of its machines," he said.

Multihost Front-Ending

But there is also a movement toward multihost front-ending, Bailey said. "People don't want to carry tapes between systems," he said. Front ends will increasingly be able to deal with higher speed lines, different protocols and a greater variety of terminals, he said.

Bailey doesn't expect IBM to replace its 3705 soon. "I think it's just going to enhance the hell out of it," he said.

CCI's own future plans include announcement of a concentrator line early next summer, High added.

Editors Monitor News With Datanews Net

WAYNESBORO, Va. – United Press International's (UPI) high-speed wire service network provides editors with the capability of monitoring the daily news flow and selecting and printing out high-interest news items within moments.

Called the Datanews distribution system, the service marries General Electric Co. Terminet 1200 high-speed printers to smaller strip printers to provide a continuing abstract on all news services.

The editor can study the abstracts, select those items in which he is interested and print out the full text on the Terminet 1200 teleprinters at a 120 char./sec rate.

The network incorporates nearly 50 printers serving both print and broadcast media in the major cities of the country.

In addition to carrying a complete flow of national news, the network allows regional stories to be put into the computerized system so that each region in effect has access to a local wire.

Six Regional Nets

Six regional networks serve major geographic areas with a communications center available to each region. Each of 92 UPI bureaus can input to the central computer in New York, so that a complete local news file is available on a continuing basis.

"Use of the Terminet 1200 printer on this select system has made it a highly important tool for the editor who has to select his articles daily or, as in the case of a broadcast editor, hourly. The abstract printer operating in tandem with the Terminet 1200 terminal allows immediate selection and instantaneous reproduction of the full article the editor selects," a spokesman said.



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Service Bureau Runs 3330-Type Drives on 360/40

By Patrick Ward
Of the CW Staff

BURLINGAME, Calif. – A service bureau here converted two IBM 360/40s to run on a 370 operating system last spring so the 40s could support 3330-equivalent disk drives.

Currently a 40 and a recently installed 360/50 are sharing eight spindles of Itel 7330-2 disk drives.

The changes that were begun to bring in the 3330-equivalent disks "have helped business quite a bit. We can get 370 overflow work now; we can be backup for a 370; and we can go to a 370 and use it as backup," said William K. Brest, operations supervisor/development analyst at EBS Data Processing here.

The service bureau handles inventory control, medical billing, hospital business DP and a range of other accounting applications.

It has branch offices in Glendale and San Diego, Calif.; in Denver; and in New York and New Jersey.

Last February, the two 360/40s were using eight dual-density disk spindles of Control Data Corp.'s 2314-type drives and were running out of disk capacity.

"We had just gone into a joint venture with Professional Automated Services in Miami," Brest said, "and we had to either add additional disk drives or get a different type of drive."

Itel offered to install its 7330-2s – which are lightly slower 3330-type disk drives, but EBS would be the first 360/40 shop to use them.

"We didn't even know if it was going to work," Brest said. But the experiment offered the advantages of faster transfer rate, more throughput and higher total disk capacity. EBS decided to go ahead.

"Installation was very difficult at first," Brest recalled. "We had a few red lights on the 40s."

Itel installed IBM's Release 27.1 of DOS and brought in the Itel TM/370 program to convert 370 instructions for the 360. During this installation phase, an Itel software specialist changed TM/370 from a 6K, core-resident program into a more economical supervisor macro, Brest said.

Itel and EBS modified the Release 27.1 compilers and the shop's 360 utilitics and 1401 emulator to work with 3330s.

The shop used the Sprint spooler from Jason Data Services to merge libraries directly from the 2314s to the 7330-2s.

Use of IBM's Device Independence package allowed the shop to run its production programs almost immediately.

Brian Peterson of the EBS programming staff put together a program to convert 2314 job control language (JCL) to 3330 JCL.

Overnight Conversion

"The only programs we had to relink were Isam files and any programs that did random read/write," Brest said. "We did an overnight conversion of 2,400 programs."

Brest placed an order with IBM for his own copy of Release 27.1, but ran into "a little difficulty in getting it. IBM kept superseding the order and telling me that I only had Model 40s and that the release would not run on Model 40s," he said.

Once the new configuration was up and running, Brest noticed from 10% to 30% more system throughput, depending on the job.

Two controllers and a two-channel switch enabled both CPUs to share the 7330-2s. The new drives had more than twice the capacity of the 2314-type units and took up half as much space. Transfer rate was higher too.

"We attempted to hook up Itel 7330-1 drives on the 40s, but we could never get over the problem of the 40s not accepting a full-speed 3330-type device," Brest said.

EBS ran the two 40s from May to August with the two CPUs sharing a common library and still using Sprint. The company then replaced the 196K 40 with a 384K 360/50, which can deliver 80% to 150% more throughput, Brest said. EBS plans to add .5M bytes of additional memory to the 50 shortly.

Data 100 Adds Key-to-Diskette Station

MINNEAPOLIS – Data 100 Corp. has introduced a dual-station key-to-diskette data-entry and communications system that is designed for low-volume sites in distributed networks, according to the firm.

The system permits one or two operators to enter, edit, verify and store data on the diskette under the control of data-entry software. Data can then be transferred to another diskette, printed on the system line printer or transmitted in batch mode via the IBM Bisynchronous Communications (BSC) discipline.

The remote-entry system allows use of prewritten input formats. The format-generation option can be ordered on one machine, which can serve the others in a network.



Data 100's Model 77 Remote Entry System

Data Entry Features

The Model 77 provides fixed entry validation, accumulators, arithmetic and logic functions and input/output formatting.

Data output can be directed to the communications facility or, using the system data-management capabilities, to the line printer, auxiliary data disk or keystation display. Data preparation modes are:

- Entry – This mode allows an operator to enter source data on a keyboard. The system validates the data according to the checks defined in the input format, assembles the keyed characters and stores them on the disk at record intervals.
- Verify – In this mode the operator reenters the data requiring verification. The system compares it against the original data and indicates error conditions.
- Search – This mode allows the operator to locate and retrieve records in order to correct, change, insert or delete their contents. The search is made against a keyed argument (a mask equal to any portion of the record content) or unique record number. The located record is displayed, allowing the operator to correct or delete it.
- Update – This mode is used to restore duplication or arithmetic relationships which might have changed since the records were originally keyed. The update operation is performed automatically on all records of a file without operator intervention.
- Directory – This mode allows the operator to display or print the contents of the system directory. The directory is an alphanumeric listing of all file names currently in the system.
- Definition – This optional mode allows an operator to create new control formats for the system. Using this mode an operator may create new formats (input, output or fixed entry), revise existing formats, delete formats or transfer them to the line printer or communications facility.

The following communications features are available:

- Point-to-point or multipoint.

(Continued on Page 31)

Itel Claims Price Advantage, Removable Media for Its 3350

SAN FRANCISCO – Itel Corp.'s 3350 disk drive equivalent [CW, Nov. 12] will cost "10% to 30%" less than the IBM product, according to an Itel spokesman. He declined to give further price information, however.

The Itel 7835/7330-12 disk storage subsystem is said to be software-compatible and functionally equivalent to IBM's 3350 disk storage. However, the recording media can be removed from the Itel drive and mounted on another for on-site data recovery.

The Itel 7835/7330-12 has a capacity of 317.5M byte/spindle. It offers a standard four-channel switch feature which allows connection of up to four CPUs to a common data base.

Customers can install the Itel 7330-10 and 7330-11 (compatible versions of IBM's 3330-1 and 3330-11) now and at a later date upgrade in the field to a 7330-12, as data base needs increase.

Itel is at One Embarcadero Center, 94111.

Burroughs to Raise Prices

DETROIT – Burroughs Corp. will increase most maintenance charges by 9% on Jan. 1. Most purchase and lease prices will also rise, but by smaller percentages.

Burroughs said it will boost lease rates 2.5% to 4% on small-scale computers other than the B700 series. Both purchase and lease prices on medium- and large-scale mainframes will go up 2.5% to 4%.

The purchase and lease rates for peripheral products will rise from 3.5% to 4%.

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Hasty Decision to Use COM May Bring Disappointment

By Patrick Ward
Of the CW Staff

NEWPORT BEACH, Calif. – Users who decide to turn to computer output microfilm (COM) out of frustration with rising output costs may be risking disappointment over the long run.

Those users may fail to do a thorough analysis of possible COM applications in their companies before they bring in the equipment, according to Kenneth M. Iversen, marketing support manager for Bell & Howell's COM products line.

Later on, when the users would like to add other types of COM jobs, they may find the COM equipment they originally chose is inappropriate for the applications they want to add, Iversen said.

DP people who may be very professional in choosing other types of equipment for their sites will "rush right into this technology because they still view it as a film and chemistry product," not DP gear, he said.

COM only began to be accepted into DP circles in 1973 and 1974 when increasing paper costs, combined with the business recession, pushed DPers toward doing something about the spiraling cost of output, Iversen said.

"A lot of COM decisions have been made up to now as an expedient to solving a bottleneck and not from a typical DP systems approach to making a decision," he emphasized. Even under these circumstances, he said, COM has finally won acceptance from the DP community as an output method.

Systems Approach

Future COM use will come from systems analysis of output alternatives pinpointing applications that COM can handle less expensively than other output methods, Iversen said.

Key-to-disk, intelligent terminals and on-line entry have all speeded up the process of getting information into a data base over the last several years, Iversen said. As for getting the information out of that data base, the choice was between CRTs and on-line printers until COM came along, Iversen explained.

Printers are a relatively slow output method; their output is bulky and has to be copied for mass distribution, he said.

CRTs provide information quickly, but require direct access to storage files, additional CPU memory and a network of terminals.

"If you look at COM with a systems approach, you can see there's a range between printed paper and CRT displays" in which COM is the best solution, Iversen said.

For example, "the 2,000th copy of a microfiche sheet is as good as the first." Since the user can put the equivalent of 270 computer output pages on one 4-in. by 6-in. microfiche sheet, it's possible to send the same daily report to hundreds of people in an organization, he said.

"Perhaps the biggest resistance to COM comes from people who want to write on their copy of a report. But that can bring the problem of having written notes on an old report when a newer version of the report comes in," he said.

Again it's a systems question, he said. "The COM user can make notes separately and keep them as reports come and go," he suggested.

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Bits & Pieces

Tape Crimper Cuts Mylar

NATICK, Mass. – Pericomp Corp.'s Tape Crimper is a hand-operated cutter used to cut and form the end of 1/2-in. mylar computer tape to enable positive loading of automatic threading transports.

The end of the tape is cut to a 9/16-in. diameter. At the same time it is cut, the end of the tape is formed with three ribs approximately 1/2-in. long and 1/32-in. high, which stiffens the leading edge of the tape.

The Tape Crimper costs $28 from the firm at 14 Huron Drive, 01760.

Tape Duplicator Works in 30 Sec

PASADENA, Calif. – The D-200 tape duplicator from Sunrise Electronics automatically reproduces either or both tracks of a 100-ft digital tape in less than 30 sec, the company said.

The D-200 duplicates tapes in all popular digital formats, according to the firm.

Signal and control inputs and outputs are available at a remote receptacle on the rear of the machine for slave operation and control.

The copier can be used to automatically certify tapes, will rewind automatically and can be used to merge information from several tapes onto one new tape, the company said.

Base prices for the D-200 start at $2,100 from Sunrise at 228 N. El Molino Ave., 91101.

Touch-Pop Holds Cassette Tapes

WHEATON, Ill. – The Touch-Pop cassette tape storage system from AV Industries, Inc. can be used to file standard-sized cassettes with the topside labels visible for easy identification, according to the vendor.

The plastic holder trays protect the tapes from dust, handling deterioration and accidental hub rotation, AV said. The cassettes snap into the holders and are ejected by slight thumb pressure.

A two-drawer cassette cabinet costs $79 and a four-drawer unit costs $110 from the firm at 400 W. Liberty, 60187.

Device Allows Fiche Inspection

PALISADES PARK, N.J. – The Type C Microfiche Inspector from Pepco MFI is said to allow the user to inspect original or duplicate cut microfiche sheets one at a time.

The Type C projects a 105mm by 148mm fiche image onto a 22-1/2-in. by 30-in. rear projection screen at 5.5X magnification. This projection permits inspection of the entire fiche's format, focus, gross density, page order and alignment.

Closer examination at full-size blowback is realized by sliding one or more self-contained lenses into place. At full-size blowback, the screen shows six document or four computer output microfiche frames simultaneously.

One or two full-size blowback lenses are available.

The device costs $3,125 from the firm at 544 Tenth St., 07650.

At Electric Company

Early-Warning System Guards Against Power Failure

PHILADELPHIA – Philadelphia Electric Co. here uses a computer-based early-warning system to guard against the kind of massive power failure that darkened the Northeast 10 years ago.

Shortly after the System Automatic Monitoring and Control System (Samac) went into service in October 1973, switching problems isolated a generating station and some substations it supplied from the rest of the network.

Voltage and frequency had risen at the station, but one of the Samac operators in the Systems Operations Office here was alerted both to the problem and the appropriate corrective action within seconds by his bank of four-color CRT displays.

That occurrence was the closest the company has come to any serious situation because Samac catches developing problems in time to prevent them from achieving major proportions. In short, the primary advantage of the system, built around a "triplex" Burroughs Corp. B6700 computer system lies in what it does not permit to happen.

By contrast, in June of 1967, a transmission line became overloaded. Samac would have pinpointed this immediately, if it had been installed at the time, but the result was a serious power disturbance that shut down the entire Philadelphia Electric system, which serves four million people in a 2,340-square-mile area in southeastern Pennsylvania and northeastern Maryland.

It also shut down part or all of the neighboring companies in the Pennsylvania-New Jersey-Maryland Interconnection (PJM) of which Philadelphia Electric is a member.

Task Force Named

A task force was named to study how to prevent this in the future. Its recommendation was that system operators should have more complete and timely information, based on monitoring a minimum of 800 points, each at a rate of 30 seconds or less.

It is impossible for humans to do this, so the decision was made to feed the data into a computer, compare it with normal values and warn operators immediately if anything approached a potentially hazardous condition.

The result was Samac, which now monitors, via remote terminal units, more than 2,000 points on generators, transformers, lines, etc., at more than 40 different locations on the bulk power transmission system, including 10 generating stations and about 30 substations.

Critical variables such as generation and tie-lines to neighboring companies are sampled every three seconds, but the bulk of the data is sampled every 30 seconds. Communication with the operators is via color CRTs.

These CRTs display the generation and bulk power transmission system in blue, yellow, green or red symbols. Blue, yellow and green are used to designate different voltage levels, and red indicates an abnormal condition.

The CRTs also display detailed information concerning the line, transformer or substation involved and print out the recommended procedure to be followed.

One bank of 10 CRTs is located at the shift supervisor's position and the other at the power director's position. Each provides a mimic diagram of the system. Below are three additional CRTs used to bring up the representations in greater detail, such as a single-line diagram of a particular station.

Since monitoring and control are completely dependent on the computers and there is no backup analog system, the reliability of the computers is of the utmost importance.

Consequently, the company installed the first commercial B6700 "triplex" or three-processor system with "fail-soft" programs which include an automatic reconfiguration capability in case part of the computer system fails.

The B6700 is fed from three uninterruptible power supplies, and if all outside power should be lost, continuous power from large batteries can sustain the system for up to 30 minutes, although a diesel generator would automatically start within three minutes to take over for the batteries.

Data 100 Launches Key-to-Diskette Unit

(Continued from Page 29)

- RS-232 – 2,000- to 4,800 bit/sec communications capability.
- Leased or dial-up, two-wire or four-wire lines.
- Auto answer for unattended transmission and reception.

Two Types of Keystations

A keystation may be equipped with either typewriter- or data-entry-style keyboards and consists of a movable keyboard, display unit and operator table. A display unit presents characters in eight lines of 32 positions each for a total of 256 characters.

An operator error is indicated by an English-language display message, an indicator on the keyboard and an audible alarm.

The remote-entry station can accommodate up to three diskette drives (two are standard). The number of drives required depends on options selected. The unit uses IBM media-compatible diskettes.

A 62 line/min belt printer with 63 Ebcdic character set and a 125 line/min belt printer with 63 Ebcdic character set are available.

A typical Model 77 with communications, two diskettes, a single keystation, the optional local formats feature and a 62 line/min printer rents for $585/mo on a one-year lease including maintenance.

Purchase price is $20,118. A second keystation, with a third diskette, rents for $110/mo and increases the purchase price by $3,570.

Data 100 is at 7725 Washington Ave. South, 55435.

Wake me when it's over

Read the Year-End Review and Forecast, a special Supplement in the December 31st/January 7th combined issue of Computerworld.

What sort of a year was it? A year like all years · filled with those events that alter and illuminate our times. And you were there, as Walter Cronkite used to say. Now it's time to leave the trees and sit back for a good look at the forest. And that's what we'll be doing in our special, combined December 31st/January 7th issue.

Edited by Drake Lundell, this special issue will review all the big stories in the 1975 computer world · from developments in hardware, software and communications to changes in computer law and the impact of computers on society. It'll be an excellent overview of what's happened, combined with some knowledgable forecasts of what's going to happen in 1976. And if you have anything to do with computers, you should be there on December 31st.

If you're a DP marketer, remember the closing date for this special issue: December 12th. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Survey by GAO to Show

Use of Minis in Government Doubles Between '67, '74

By Nancy Freneh
Of the CW Staff

NEW CARROLLTON, Md. – Results from a General Accounting Office (GAO) study that will be released soon indicate minicomputer use in the government more than doubled between 1967 and 1974 – and 82% of those surveyed envision even wider use in the future.

The government minicomputer population grew from 3,700 in 1967 to 7,800 in 1974, Walter Anderson, GAO associate director for DP and financial and general management studies, told a group of 200 industry and government executives at a three-day minicomputer symposium held here recently by the American Institute of Industrial Engineers and Management Education Corp.

The study was undertaken to determine just where minicomputers fit into the government DP picture, according to Anderson, and all users who responded gave minis high marks for performance.

Excellent Performance

In the survey, a total of 94% of the respondents rated overall performance as excellent or good – 39% reported excellent and 55% good. Five percent indicated performance was fair and only 1% reported performance was poor.

The study found 52% of the minis were used for scientific experiments and data processing. Process control, communications, input/output and other applications were in the minority. Only five users reported their systems were used for more than one purpose.

Asked why minicomputers were acquired, 44% said they were acquired to automate something previously done manually. Only 2% used minicomputers to replace larger systems, and 10% acquired minis to augment other systems.

"If we had to pick a weak category, we would say 'manufacturer's technical support' was the weakest, but even in this category more than half the respondents indicated excellent and good rather than fair and poor," Anderson said.

Applications Software

With regard to applications software, 65% of the respondents developed the software with in-house personnel, while 9% received software from the manufacturer.

About 11% used an independent software developer and 11% obtained software from a system supplier. Only 3% used more than one source for applications software, he said.

As for programming language, 44% said they used Assembly or machine language, 7% used Basic, 11% used Fortran and 11% used other languages.

Not one user reported using Cobol, but 26% said they used more than one programming language.

Findings were based on responses from 151 government users, Anderson said.

With respect to some of the problems caused by limitations of the computer system's capabilities, only 10% to 15% reported any problem in the categories of instruction set, word size and numbers of registers.

In the area of storage capacity, however, 40% indicated this limitation caused them problems, but the general tone of the responses was "highly positive," Anderson said.

The review attempted to determine what problems government users encounter with minicomputers, Anderson said. One problem was that the same level of procurement control was often exercized for a low-cost mini as a higher priced major system.

"I personally counted 34 circulars, regulations and bulletins that applied to DP procurement and management," he said, "and this does not include armed services procurement regulations."

However, during the course of the review, some of these regulations were changed, he pointed out.

"It's also interesting to note the drop in cost between 1967 and 1974," Anderson said. A quarter of the computers in 1967 cost $50,000, whereas

(Continued on Page 34)

CW at Mini Symposium

Service Seen Consideration in Buying Mini

By a CW Staff Writer

NEW CARROLLTON, Md. – "Buying a minicomputer is like buying a car – you don't buy the biggest and the best if the dealer in your area gives poor service," Chuck Butkus, president of O.G. Enterprises, Inc., an independent firm specializing in medium and small business application systems, said here recently.

Butkus made the point before an audience of about 200 government and industry people attending a three-day minicomputer symposium sponsored by the American Institute of Industrial Engineers and Management Education Corp.

"A minicomputer is a big investment for the first-time user. The only way he can justify that investment is if the system saves him money or helps provide better service to his customers without added cost," he said.

Automating inventory and accounts receivable and generally improving the company's cashflow problems is usually the first application, he added.

Four Options

Before buying, the businessman should make certain a service bureau wouldn't serve him as well at less cost. Unfortunately, he said, here the businessman is faced with several days' turnaround, especially at quarterly reporting time when all the service company's customers want their reports.

Second, he could share a system with another firm. That's not such a bad choice but, in this case, a user can't always get machine time when he needs it, he stated.

The third choice is tying in with a time-sharing firm. While this option is the most flexible of the three, it can cost a lot of money, Butkus claimed.

"For the $20,000/year timesharing might cost, the businessman could buy two minicomputers over two years' time and only plug in the second one for backup," he said.

In making his decision, the businessman must ask himself how many hands his input goes through before it gets into the computer and gets back to him, Butkus advised. He will realize that, with all the other choices, he loses control of his files and his input, he said.

In this case, buying a small minicomputer is the best choice.

Besides service problems, the mini presents several other problems of which the small businessman should be aware.

Users must think about configuration. "It's ridiculous to back up a disk with 38 diskettes or 20 cassettes, for example. It takes so long to back up the system you'll let it go for a month.

"What you need is two large disks – 5M or 10M bytes each."

He also pointed out the average user of the $20,000 to $30,000 minicomputer should expect to spend another $6,000 to $7,000 on software.

S/3 Called 'Worst Buy on the Market' When Only Cost per Calculation Examined

By a CW Staff Writer

NEW CARROLLTON, Md. – Based on cost per calculation, the IBM System/3 is probably the "worst buy on the market," John White, senior computer scientist for Computer Sciences Corp., told attendees at a three-day minicomputer symposium held here recently.

But a user pays for "great support and service" in that price, he added.

"When your system is down, IBM will be there in two hours – its people may not be able to fix it any more quickly than the other vendors, but it'll surround your machine with people," he said.

Average response time for other mini vendors is four to six hours, he claimed.

Other recommendations White made to about 200 government and industry members who expressed interest in how minis perform compared with their larger, more expensive DP machines included the following tips.

Digital Equipment Corp. is primarily a hardware vendor. While it will provide a minimum of software to the end user, it is principally OEM-oriented – it looks to systems houses to package its systems, he explained.

As for how to be sure the user is getting the best, White noted that in the minicomputer field there are relatively few unique CPU designs.

"If you look inside DEC's RP04 disk drive, for example, you may find the name 'Univac,' " he said.

"New designs are copied quickly," he said, adding, "if one vendor introduces a truly unique CPU design, its competitors can offer a copy in three to six months."

As for cost, White pointed out a minicomputer with a 32K memory, a console and disk stor-

(Continued on Page 34)

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Two books will be published this Winter:

- **Loglan 1: A Logical Language**, a grammar and general introduction; 316pp; $7.50 hardback/$4.50 paper.
- **Loglan 4 & 5: A Loglan-English/English Loglan Dictionary**, 16,000 English/4000 Loglan terms; 532pp; $9.50 hardback/$5.50 paper.

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Qantel System 1300 Compatible With, Four Times Faster Than Earlier Models

HAYWARD, Calif. – Qantel Corp. has upped the speed and capacity of its line of small business computer systems with the introduction of the System 1300.

The system is fully compatible with earlier units from the firm and can be field-installed with current software and peripherals, the firm said.

In addition to providing internal processing speeds an average four times faster than those of other Qantel systems, the System 1300 expands memory capacity to 128K, the firm said.

Priced at $42,500 for delivery in early 1976, a minimally configured System 1200 includes 40K bytes of memory (8K of which are available to the user), 6M bytes of disk storage (3M bytes fixed, 3M bytes removable), a 27-line, 1,728-character display terminal and a medium-speed serial line printer.

"To our knowledge," according to Qantel President Douglas K. Baker, "this is the first time in the mini-based business computer marketplace that a manufacturer has introduced a substantially faster processor that is completely compatible with its existing hardware and software product lines and that therefore can be installed in any existing installation without the need for a change of software."

Uses Base Registers

The 1300 processor uses base registers to dynamically address memory, avoiding prior necessity for program relocation and excessive data indexing, Qantel said.

In addition to executing the entire instruction set of the current Qantel processor, the System 1300 processor provides additional instructions.

Stacking instructions handle both program pointers and data, simplifying the generation of reentrant code. More powerful MOVE, SEARCH, TRANSLATE and COMPARE instructions accept indirect lengths for data movement and comparison, eliminating the need for such subroutines and providing as much as a 10 to 1 performance improvement in some data analysis functions, the company said.

The System 1300 is compatible with Qantel's Best operating system. Complete software support for the system's 128K hardware capability will be available in early 1976.

Comparative tests run showed a 2 to 1 improvement, with some tests producing as high as a 3.5 to 1 performance improvement, the firm claimed.

Faster interfacing between peripheral and processor is also achieved, it added.

Miniworld Products

Ampex Add-On Memory Gives 32K to Nova 2s

MARINA DEL REY, Calif. – Ampex Corp. has added a 32K-byte add-on memory which is pin-compatible with the Data General (DG) Nova 2 to its family of minicomputer memories.

The Ampex ARM-2 offers data access in 280 nsec and 800 nsec full-cycle operation in 16K modules. "The cycle time of the 16K word module permits the CPU to operate at a faster effective speed than the equivalent DG 16K module," Max Bennett, vice-president, said.

A user can therefore maximize his computer operating speed while saving 20% on memory cost and also free card slots for other functions, according to Bennett.

The 16K module operates in any address field or in up to four nonsequential 4K address fields. The module is compatible with all models of Nova 2 and no modifications of any kind are required to either software or hardware.

The 16K word ARM-2 is priced under $2,000.

Tycom Bases I/O Printer On Standard IBM Selectric

FAIRFIELD, N.J. – An input/output printer based on the standard IBM Selectric is being offered from stock by Tycom Systems Corp. here.

The Tycom 735 utilizes the Holmes Tycom baseplate and converts any Selectric I or Selectric II into an I/O printer. The Tycom system is similar to the IBM 735 I/O printer which, until IBM announced its discontinuation, was the only other Selectric-based I/O printer on the market, according to Tycom.

Price of the Tycom 735 is $835 from the firm at 26 Just Road, 07006.

MDB Has PDP-11 Interface

ORANGE, Calif. – A Digital Equipment Corp. PDP-11 Unibus-to-peripheral interface with address and dual vector interrupt logic in place is available from MDB Systems, Inc. here.

The module optionally includes three ribbon cable connectors for interconnection between the MDB-1710 and external devices or other MDB modules. The interface board is priced at $250 from the firm at 981 N. Main St., 92667.

Government Use of Minis Doubles

(Continued from Page 33)

1974 figures indicated nearly half the computers installed that year cost under $50,000.

Many changes have occurred in the minicomputer environment in the past seven years, Anderson said. Originally minis were dedicated primarily to scientific and manufacturing applications, but now minis are applied for general purposes as well.

Both general and dedicated applications are expected to expand, he added.

A few years ago vendor support was nonexistent or low because sales were to original equipment manufacturers who had their own capability for installation and support. Software did not include higher level languages while now many systems do.

Peripherals were also few and far between. "This is vastly better now, but we still don't use the word 'plug-compatible' much in the mini area," he said.

Also, major changes in the mini seem to come about every two years compared to the six-year generation experienced in major systems.

Today systems houses can provide total services, hardware, software, installation and operation. "This goes farther than pure facilities management," he said.

Managers should view the minicomputer in perspective and consider their technical attributes. They should consider the cast of characters, recognize their proper applications and, most important, view the minis as "one alternative rather than a cure-all," he advised.

"Then, if all signals are go, you can give your approval because your people will be proceeding on a basis of true love instead of infatuation," he said.

S/3 Called 'Worst Buy on Market'

(Continued from Page 33)

age is available for $15,000 and up.

Controllers, however, are expensive items, he said. A controller and the first floppy disk drive will cost about $3,000, but once a user has a controller, each additional drive costs only $1,000.

Software Big Item

White warned attendees "software can cost more than hardware."

Development costs are extremely high, he noted, with a real-time control system costing about 200% to 500% more than the hardware it runs on.

"If you're lucky, you can check out a new real-time control system at the rate of .5 instruction/hour. A research and development system is somewhat cheaper and can be checked out at the rate of 1 instruction/hour," he said.

An application to solve a very well defined problem is still cheaper and can be checked out at the rate of about 2 instruction/hour, costing "only 50% to 100% more than the hardware that will be used to operate it," White said.

Using an in-house dedicated minicomputer is a much more economical way to go than time-sharing, according to White, in cases where the user must maintain a large data base.

Finally, from the customer's point of view, it's probably a good idea for him to lease until he is sure he's satisfied. Only then should he purchase.

Automates Four Functions

Mini Streamlines Airport Duties

TURIN, Italy – Ranking third among Italian airports in volume of freight shipped, Citta di Torino airport here is pioneering an Aircraft Loading and Balancing Automation (Alba) system which uses a Hewlett-Packard (HP) 2100 minicomputer and software developed by the Aeroitalia SAS Group.

Alba was specifically designed to speed up all activities relating to flight departures at medium-size airports with up to 100 departures per day.

The system automates four major functions that previously were handled manually – aircraft weight and balance calculations, the management of outgoing freight and mail, passenger check-in and passenger boarding.

Calculation 70% Faster

Livio Petrini, head of the airport's operations department, said "we have achieved an impressive 70% reduction in time for calculating weights and balances.

"Data such as the number of passengers and the location and weight of freight, mail and baggage onboard is computed to determine aircraft center of gravity and take-off weight – information needed by the pilot," he explained.

"Not only can we prepare the load plans faster, but changes for calculation errors have been greatly reduced."

Petrini also reported a 40% time savings in managing outgoing shipments of freight and mail since the system was installed last May.

"In 1975, we expect to top last year's shipments of more than 12,300 metric tons. And with Alba we will be able to handle increased shipments without adding more personnel," he said.

To the more than half a million passengers departing from Turin airport annually, the check-in procedure may not have changed drastically, but ticket agents can now provide them with accurate and up-to-the-minute flight information including space availability and wait listings.

Passengers and their baggage departing on the more than 30 daily flights scheduled by seven national and international airlines are checked in via four display terminals. Alba automatically checks passenger reservations, places the traveler on the flight list and records baggage weight.

At the boarding gates, cards issued earlier at the check-in counters are read by an optical mark reader which transmits the identities of all boarding passengers directly to the central system.

Receiving the data from check-in counters, boarding gates and the freight office, the system prepares the final preflight document – the load plan.

Expansion Planned

"This is just the beginning," Petrini said of the present use of Alba. "Plans for expansion include handling of nonsecheduled charter, mail and freight flights and the management of incoming freight shipments.

"At present, Alba is in full operation around the clock. So there is a need for redundancy and we are planning to install a backup system by 1977.

"With the added capability, the second system might also be used to handle the general-purpose DP tasks for the airport."

Heart of the Alba system is a Hewlett-Packard 2100 microprogrammable minicomputer with 16K words of memory, a 5M-byte disk, tape punch, tape reader and system console, all located at the Alba operation center.

Seven video displays, a teleprinter, a 200 line/min printer and an optical mark reader located at the other data input stations complete the system's hardware, which cost about $70,000.

"Our operation and its success is carefully watched," Petrini said, "and there are at least five Italian airports seriously interested in the system."

Typesetting 50% Quicker With On-Line Editing Unit

PROVIDENCE, R.I. – A computer system with on-line editing features has enabled a commercial typographer here to increase phototypesetting production nearly 50% over prior levels.

With the system, Typesetting Service Co. can handle more than 100 jobs during a single eight-hour shift, compared with a maximum of 60 using the previous system without on-line editing.

The system, a Digital Equipment Corp. Decset-8000, has been in operation since January.

Originally developed for newspaper typesetting operations, it was adapted for a commercial environment by DEC and Typesetting Service Co. personnel, mostly by substitution of software for display and tabular formats in place of the classified advertising package normally supplied.

Input to the system is by paper tape, 90% of which is generated by keyboard perforators and the other 10% by an optical character reading scanner. As the system reads the tape, hard copy for proofreading is produced by a line printer.

All corrections to the original copy are then accomplished through the Decset-8000's VT20 subsystem, consisting of two video display terminals and a PDP-11/05 controller.

Terminal operators call the copy needing corrections from the system's disk storage units. The VT20 subsystem stores up to 10,000 characters of copy, and each terminal can scroll through 48 inches of copy without addressing the host system.

Operators can perform editing functions ranging from character and line correction to moving entire sentences or paragraphs. After editing is completed, the system outputs corrected, justified and hyphenated copy directly to two Fototronic 1200 phototypesetters.

According to Jim Higgins, Typesetting Service Co. president, the system's most valuable single improvement is its ability to avoid repunching of corrected copy.

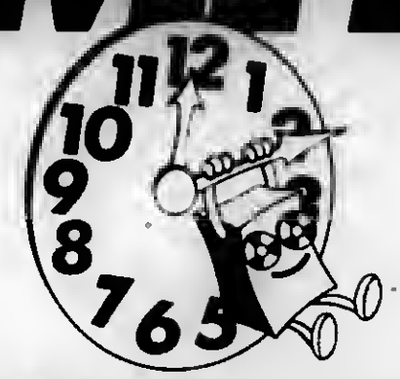
"By assigning corrections to the video terminal operators we avoid interruption of input copy flow," Higgins said. "Under old conditions, breaking a two- or three-hour job to repunch a correction could cost a half-hour's productivity because each correction had to be coded, punched and read into the computer.

"Editing by video terminal eliminates most of the coding and all of the tape reading and doesn't involve the input operators at all," he said.

Higgins cited the system's ability to handle several jobs simultaneously as another major advantage. "The system can read and punch tape, service the VT20 system and feed the 1200s at the same time. Our older system could only read or punch tape or justify and hyphenate one job at a time."

Typesetting Service Co. first began phototypesetting nine years ago with a key-to-magnetic-tape system that required the operator to perform all hyphenation and justification. In 1972 the company graduated to computerized typesetting with a DEC Typset-8 storage and edit system and one Fototronic 1200. The second 1200 was purchased six months later.

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1. All computer figures are taken from projections of International Data Corporation, the world's largest EDP market research firm.
2. State-by-state numbers are number of *computer systems* in state.
3. Percentage figures represent percent of total U.S. computer systems installed in state, measured by value.
4. States in lighter shading are ten largest measured by value of computer systems installed. States in darker shading and Washington, D.C. are next biggest.
5. Cities shown are 1976 Computer Caravan sites. Inner circles are 100-mile radius from city. Outer circles (where shown) are 200-mile radius from city.

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Computer Caravan/76 brings a national computer conference to key computer-using states across the country.

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COMPUTER INDUSTRY

CDC's Norris Charges

Export Rules Robbing U.S. Firms of $1.8 Billion Market

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Confused and overrestrictive U.S. policies on computer equipment exports may rob U.S. manufacturers of an estimated $1.8 billion opportunity to sell peripherals in Eastern Bloc countries, William C. Norris, Control Data Corp.'s chairman and chief executive officer, said here recently.

These policies have already cost U.S. manufacturers the loss of a major part of the mainframe market, he said.

"Restrictive U.S. policies have provided socialist countries the incentive to accelerate development of their own computer industry" and systems like the Ryad 1040 are the result, he said.

"They can aiso build more advanced peripheral equipment, and they undoubtedly will," Norris said.

However, "the rate of doing so will depend on availability, from the outside, of more advanced peripheral equipment to meet their needs."

Hard to Tap Market

At a news conference here recently during which the Ryad 1040 was displayed but not operated for about 100 reporters and government officials, Norris explained the difficulties in tapping this market.

It would take six months to obtain a license to export to an Eastern Bloc country a U.S. computer with a performance level comparable to the 1040, Norris said.

In addition, safeguards would undoubtedly be required, such as quarterly inspections to assure the system was being used as the customer said it would, he said.

"Many persons in Washington assume the socialist countries are far behind the U.S. in computer technology," Norris said. "They therefore assume that Soviet military capabilities could be significantly increased if the U.S. sold them computers.

"Even some government people who are concerned with the administration of the export of computers are not too well-informed," he said.

A test of the Ryad 1040 has demonstrated the sale of standard U.S. computer equipment would "not basically enhance the military capabilities of the Soviet Union," he said.

"Consequently, there is a substantial opportunity for the export of Western peripheral equipment to those countries today," he said.

Results of tests run by CDC showed the Ryad 1040 is three to four times faster than the IBM 370/145 in solving scientific types of problems. In commercial applications, the 1040 is about the same speed as the 370/145, Norris said.

However, the peripheral equipment offered with the 1040 is not as technically advanced as the mainframe itself, he added.

Eastern Block countries are having greater success in producing viable computer mainframes than in producing high-quality, high-performance computer peripherals, he concluded.

Since the Ryad 1040 demonstrates a level of performance comparable to that of medium-sized U.S. computers, the implication is that the Eastern European market for U.S.-made medium-sized and smaller computer equipment is "climinated," he said.

And, since the more powerful Ryad 1050 appears to be progressing favorably in the USSR, it will probably eliminate

(Continued on Page 40)

Cooperation Begins at Home

WASHINGTON, D.C. – Control Data Corp. Chairman William C. Norris, has called for a partnership between American business and the U.S. government to undertake a program of technology exchange with the Soviet Union – at the level of $25 billion – over the next five years.

"In the long run, exchange of technology with the Soviet Union offers the greatest business opportunity," he said.

In the three and one half years since the U.S.-USSR agreed to establish scientific and technological cooperation, no extensive exchange of technology has occurred.

"The reason is restrictions on trade imposed by Congress," Norris said.

The U.S. needs a better defined and more aggressive program to develop business opportunities with Russia and the other socialist countries, he remarked.

To achieve that end, Norris suggested a program for "collecting and disseminating information on the state of technology in socialist countries and the business opportunities presented."

Norris called on government and business to change their present "adversarial relationship" into a partnership and suggested the U.S. establish a definitive and aggressive blanket program with the USSR for technology exchange.

U.S. government agencies lack a full understanding of the status of socialist technology as well as the technological needs of the U.S., he said.

"Consequently, there is no government leadership in identifying opportunities and there is little help offered in qualifying export applications. The approach used is more that of challenging every aspect of an export request rather than looking for means to qualify it," he said.

The French, British, Germans and Japanese all approach export business in a mode of business-government

(Continued on Page 40)

IBM Export to Intourist Nixed

WASHINGTON, D.C. – The U.S. Department of Commerce has rejected IBM's application for an export license for a reservations system designed around a 370/158 and a 145.

The system was to be used by Intourist, the Soviet travel agency.

"The U.S. government concluded the system couldn't be adequately safeguarded from unauthorized use," an IBM spokesman said.

Last July, IBM received approval from Commerce to supply a 158, 10 System/7s and associated terminals and spare parts to the Soviet Union's Kama River Auto Works plant foundry [CW, June 25].

Also last summer, Commerce issued a license to Univac to supply a dual-processor 1106-11 to Aeroflot, the Soviet airline.

IBM originally applied for a license for the Intourist system in 1973, and the system was reduced from two 158s to a 158 and 145, along with Model 3330 disk drives and a number of terminals.

The spokesman explained IBM had discussed the probability of license approval with the departments of Commerce and Defense prior to submitting its application. "Although some concern was expressed with the hardware configuration of the system at that time, the government did not discourage us," he said.

"Over the past two years, we have continued a dialogue with the U.S. government and reconfigured the equipment to lessen any exposure for unauthorized use.

"We certainly understand and accept the decision that has resulted from an appropriate government review process," the spokesman said.

GE Could Have Been Number Two: Bloch

By Edith Holmes
Of the CW Staff

NEW YORK – General Electric Corp.'s (GE) decision not to attack the IBM customer base by developing an advanced product line of small- to medium-sized machines was a mistake, the man charged with developing the plans for GE's APL series recently told the court hearing the government's antitrust suit against IBM.

Had GE committed itself to fighting for IBM 1130 and 360/20, 25 and 30 customers, it could have attained a 10% share of the market and the number two spot in the industry, according to Richard M. Bloch, now a consultant.

GE considered both an increased market share and industry leadership essential to its continuation in the systems business. And Bloch believed the company could reasonably attain such a market share within about seven years and second place in the industry well before the close of this century.

But GE's top management decided it couldn't compete effectively against IBM and its decision to cancel plans for the APL series coincided with the decision to merge its computer business with Honeywell's in 1970, Bloch stated.

While he wasn't certain of all the views behind the GE exit, Bloch recalled GE management felt IBM had too much of a head start, GE would never reach the planned 10% market share from its 3% to 4% position and IBM was to be feared as the leader in the computer field.

Investment Required

Top management may also have balked at the $858 million investment Bloch and his team contended the APL series would have required. He estimated the proposed product line would have taken at least six years to become profitable.

During that period, beginning in 1969, GE would have had to invest $265 million to develop the new products, another $155 million to market them and build up its customer base and a final $438 million to cover the "lease effect."

Having long considered himself a protagonist in challenging IBM's leadership of the industry, Bloch worked for Raytheon, Honeywell and Auerbach Associates before coming to GE in 1968.

As head of Raytheon's Computer Division from 1947 to 1955, he was involved

(Continued on Page 41)

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CDC's Norris Charges

Rules Losing U.S. a $1.8 Billion Mart

(Continued from Page 37)

East European markets for U.S. large computer imports, leaving only an export market for large special-application computers, Norris said.

Development of the five models of the Ryad series was assigned to different Eastern Bloc countries. Robotron in East Germany produced the 1040.

Although Robotron's director, Fritz Wokurka, who was present at the news conference, admitted only 50 computer systems of various types actually were built in Eastern Bloc countries in 1974, socialist technology and manufacturing capability has advanced to the point where any need "can be met by their own resources," Norris emphasized.

"Let me give you one very specific example of how U.S. computer export policy made a competitor out of a potential customer of ours," Norris said.

In 1969 CDC asked for an export license for a graphics display system for the shipyards in Rostock, East Germany. "The export license was denied," Norris said.

In 1971 CDC was denied an option to exhibit a similar graphics system at the Leipzig Fair in East Germany.

The Hungarian Academy of Science observed the absence of the graphics display at the Leipzig Fair and proceeded to develop an equivalent unit, which it exhibited in 1972.

Norris described the Hungarian model as "more advanced" than CDC's mid-60's model – it was "built later" and used "more current technology," he said.

CDC is considering purchasing several to connect with its larger computers sold in the East because the firm is still unable to get export licenses for equivalent U.S.-manufactured devices, he said.

Norris said CDC purchased the system strictly for testing and for demonstration purposes.



Wokurka



CW Photos by N. French

Norris

Industry, Government Partners Vital for USSR Technology Pact

(Continued from Page 37)

partnership. They work together through all phases including identification of opportunities, proposals, export application processing and financing.

In contrast, the American procedure is for the U.S. government to hold separate meetings with other governments with no involvement by U.S. business. "Often, the only way Control Data can learn the content of these government-to-government meetings is by having employees of our overseas branches communicate with the other country's representatives," Norris said.

He suggested the U.S. negotiate and establish a definite level of technology exchange with the USSR – similar to the recent grain agreement – for perhaps $25 billion over a five-year period.

Under the terms of the overall agreement, individual companies could negotiate contracts up to the aggregate amount, Norris explained, on the condition the U.S. receive an appropriate amount of equivalent technology for that given.

Cooperative efforts with other nations will help, he said, and the Soviet Union, being the second largest industrial nation with the largest number of scientists engaged in research, offers the greatest opportunity for such cooperation.

Despite a gross national product smaller than that of the U.S., the Soviet Union has a scientific and technical establishment at least 20% greater. It includes 5,000 research establishments employing more than one million scientific workers, based on a Soviet count, Norris said.

Norris admitted the U.S. does have more technology than any other country and the greatest expertise in converting technology into useful products and services. The capitalist economy rewards this type of entrepreneurial effort, he said.

The USSR, on the other hand, rewards the academician and the theoretician, who count among that nation's highest paid groups. With its huge number of scientists and engineers, the Soviets have produced a vast amount of technology that is of a "basic, conceptual nature," Norris said, adding, "Thus the basis for a very productive cooperation exists."

Chandeliers for CPUs

WASHINGTON, D.C. – How will the Russians pay for U.S. technology. Will the currency be "hard" – in gold or dollars – or will it be "soft" – in the coin of the realm of Poland, Czechoslovakia or whichever country is to be the recipient of U.S. products contemplated under Norris' plan?

Control Data Corp. is prepared to be paid in hops or crystal chandeliers, according to a spokesman at the recent display of the Soviet Ryad 1040.

Through its subsidiary, Commercial Trading International, Inc., CDC has the capability of bartering whatever payment it can negotiate with Eastern Block nations for cash somewhere else in the world, the spokesman said.

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Chicago	Hyatt Regency O'Hare	Mar. 8-9
Wash., D.C.	Stouffer's National Center Inn	Apr. 6-7

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Orlando, Fla.	Sheraton Towers	Feb. 18-20
Seattle	Airport Hilton	May 19-21

Performance Evaluation and Improvement
Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. Topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems. Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

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Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers. Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

New York	Essex House	Jan. 26-27
Chicago	Hyatt Regency O'Hare	Mar. 15-16

Data Communications Course #1020 – Advanced Teleprocessing Systems & Design
Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

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Burroughs Chief Credits IBM's Success to Management

By Edith Holmes
Of the CW Staff

NEW YORK – IBM has been successful because it has had a continuity of good management over many years, according to Ray W. Macdonald, chief executive officer of Burroughs Corp.

In addition, the corporation was in at the beginning of the office equipment business and so has tended to better understand customer needs and to adapt much of its punch card equipment to I/O devices, Macdonald said in a deposition read into the record of the U.S. vs. IBM case by Justice Department attorneys.

"IBM has experienced considerable good fortune," he stated, adding, "I don't criticize the corporation for having taken advantage of all this."

But, while he praised IBM, Macdonald's deposition offered criticisms as well. Burroughs was disappointed with IBM's 360 line at the time of its introduction because it used machine-dependent Assembly language rather than high-level languages, he noted. He testified Burroughs had hoped IBM would take the lead in this area.

Much of the 360 line's success stems from IBM's ability to sell the public the notion of compatibility within a "family" of computers rather than to any technological breakthroughs, Macdonald said.

Burroughs to Prosper

With regard to Burroughs, Macdonald said it will survive and prosper, regardless of whether IBM is eventually broken up into four or five companies as a result of this case or congressional legislation. He expects Burroughs to keep growing at about 15% each year in revenues.

Making four or five companies out of IBM would be asking for domination by all of those companies, he said. They will all put out the same equipment and advocate the same approaches in the marketplace.

But Macdonald added he believes users should be free to choose the best, most cost-effective equipment they can. And there are elements in the industry which could enter the marketplace successfully with their modest resources if IBM was not there, he said.

Describing his company, Macdonald said Burroughs also had its roots in the early tab card business. In the mid-1960s, the corporation set out to broaden its range of products and extended its manufacturing facilities and marketing force. Macdonald also said the firm gradually shifted to a line of business approach during this time period.

Asked to describe Burroughs' competitors in medium-to-large-scale systems, he identified IBM, Honeywell Information Systems, Control Data Corp. and Univac.

NCR Corp., Nixdorf, Philips, Fujitsu and Hitachi are the company's chief competition in the intermediate to smaller sized mainframe arena, he added.

Minicomputer manufacturers have provided little competition until recently primarily because minicomputers were a minor factor in the marketplace until the last two years, Macdonald said.

The Burroughs executive viewed peripherals companies as OEM suppliers rather than competitors in the end-user marketplace. Many of Burroughs' peripherals are built to its specifications by peripherals manufacturers and are marketed with the Burroughs trademark, he noted.

Recently, however – but to a small degree – the company has encountered some direct competition from the peripherals makers in the end-user business DP field, he testified.

Service bureaus compete rather extensively with Burroughs, Macdonald continued, because users see them as alternatives to their acquisition of small or medium-sized systems.

Time-sharing services, on the other hand, tend to be very specialized in the application areas they offer to users and so don't compete directly, or really indirectly, with Burroughs, he said.

GE Could Have Been Number Two: Bloch

(Continued from Page 37)

with the paperwork for its Raycom, a business-oriented machine, and led the team accomplishing much of the development of Honeywell's H200 line.

Bloch indicated he felt frustrated with the actions of GE's top management because he had confidence in the company's history in the field and his own ability in similar circumstances "to launch successful programs against the industry leader."

The resources – financial and otherwise – were much greater at GE than were those available to him elsewhere, he added.

Finally, in retrospect, he contended that in emphasizing small machines and networking, GE's plans for the APL correctly anticipated developments in the evolution of semiconductors, the marriage of communications and computers and the advent of distributed processing.

At the same time, he also expressed his admiration for the "splendid management" at IBM. Bloch attributed IBM's success to its sustained effort to be a paramount element in the business equipment field.

IBM manifested a greater dedication – "commitment and resolve to succeed" – than did either Sperry Rand, from which it captured the industry lead in 1953 or '54, or GE, Bloch said.

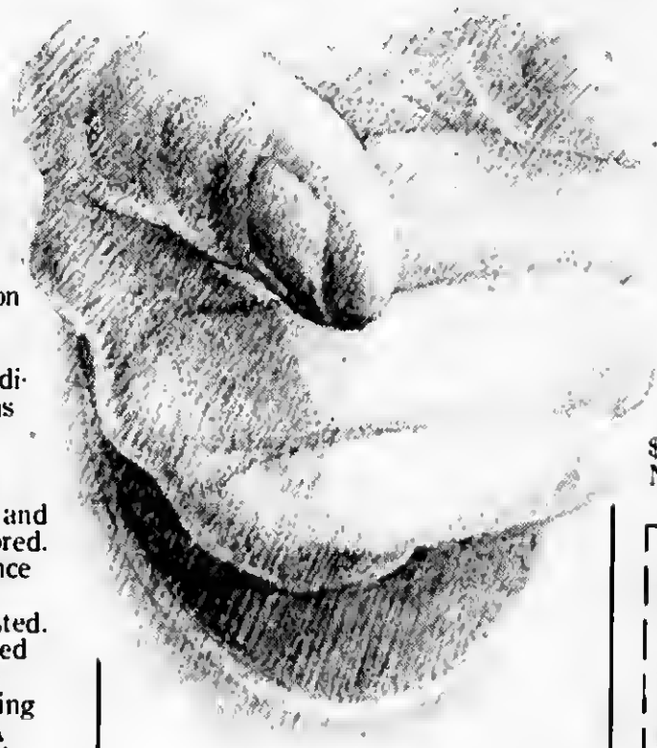
He added IBM did not have the resources of either of these companies when it entered the systems business in the early 1950s.



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IBM 'Blessing' of Front End Rescues CCI

By Patrick Ward
Of the CW Staff

TORRANCE, Calif. – IBM's introduction of its 3705 communications controller helped lift Computer Communications, Inc. (CCI) out of bankruptcy proceedings to two straight years of profitability, according to President Raymond E. High.

The 3705 introduction "blessed the front-end concept" just as CCI was veering toward Chapter 11, said Charles B. Bailey Jr., vice-president of marketing.

Before the 3705 came along, CCI "had been trying to sell front ends to people who had never heard of them," Bailey said.

The company has now climbed back from its reorganization in late 1973 to early 1974 and has enjoyed two profitable years in a row for the first time in its history.

CCI now has 113 full-time employees and a three-year agreement to supply Memorex Corp. with front-end processors.

The company's $4.5 million volume last year should double to about $9 million this year, High said.

"CCI had been doing very well back in the late 1960s," he recalled. But "during the 1969-1970 time frame, it was fashionable to make acquisitions of other companies. CCI made three, all of which turned out unfortunately," High said.

In conjunction with the announcement of its first front-end processor system in 1970, CCI started work on a large, on-line nationwide stock-brokerage network.

"This was a very expensive effort," High said. "When the client collapsed in 1971, we had a multimillion-dollar development project 80% complete and no customer," High said.

CCI decided to complete the project and try to market it to other major brokerage firms.

"But none would put their livelihood in the hands of a small organization of 80 people," he said. CCI finally sold the system to the Midwest Stock Exchange "on unfavorable terms."

Meanwhile "the subsidiaries were causing a substantial cash drain on the company," High continued.

CCI tried to offer convertible debentures in the fall of 1972, but that effort failed, and the company withdrew them in early 1973.

"It then became known in the industry that CCI was in trouble," High said. It was very difficult to market front ends to customers who were planning to use the equipment for five years or so and weren't sure we'd be around then," High said.

In June of 1973, the company was $5 million in debt. The original president and founder of the company left office, he said.

"We had 149 people and paychecks bouncing all over the place," High said. "We were coming in on weekends with wives and kids to clean the building."

"We cut the staff from 149 to 78, promising them that if we did make it, they'd be reimbursed, since we couldn't pay the 78 either."

There were efforts to sell CCI to gain financing, but on Aug. 23, 1973, the company filed for bankruptcy.

"We started meeting with the creditors and went through Chapter 11 in six months and came out on our own with no new financing," High said.

"We gave unsecured creditors one share of CCI stock for every $3 of debt. And we restructured our due bank loan of $2.2 million into a five-year repayment," he said.

"We were fortunate in that we had an existing customer base whose networks were expanding. Some placed orders just to help us get through the period," he said.

Not only has the company made a profit for two straight years for the first time in its history, but it has the largest backlog in its history right now, High said.

That backlog grew when Memorex placed a three-year order for CCI CC-80 front ends this spring. Memorex markets the device as its 1380 front end.

The CCI/Memorex contract is more than an OEM agreement, High said. The pact contemplates joint enhancements to current products and joint development of a future product line, he said.

CCI also gets optional access to the Memorex service organization for field support of the CCI product line.

Orders & Installations

Winn-Dixie has orderd 994 Model 2100 portable data entry terminals from MSI Data Corp.

The city of Redondo Beach, Calif., has installed a Microdata Reality system to provide an on-line municipality data base capability.

International Components Corp. has installed a Burroughs B-1712 system.

Remote Service Unit Ltd., an organization of 21 Wisconsin savings and loan associations, has ordered Cash-Plus, an electronic funds transfer system from NCR which includes 35 NCR 279 terminals.

Computer Information Corp. has installed a Univac 90/30 system.

The Financial Systems Group of Digital Equipment Corp. has installed Sofco, Inc.'s Basic Business Language on two of its in-house Decsystem-10s.

Central National Bank of Cleveland has installed The Capacity Meter, a computer measurement system manufactured by CRU, a subsidiary of Computer Resources, Inc.

Accurate Data On-Line, Inc., a DP service bureau for credit unions, has installed a Burroughs B2700 for use with on-line credit union applications.

The first installation of Harris Corp.'s S220 computer system will be made at the University of Illinois at Urbana-Champaign. Its prime function will be to provide an on-line computational capability while concurrently backing up three minicomputers involved in a research project of collecting and analyzing brain waves.

Famous Artists Studios ordered a Univac 90/30 system for maintaining mailing lists and distribution records.

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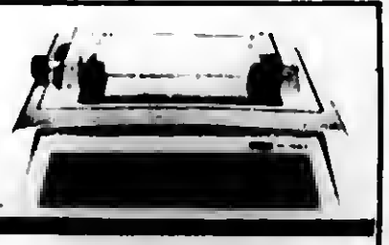


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DEC Repackaged Systems

By Edith Holmes
Of the CW Staff

NEW YORK – Digital Equipment Corp.'s efforts to cater to the end-user business DP market in the '70s meant repackaging and reprogramming its PDP-8, PDP-11 and Decsystem-10, according to Winston Hindle, a senior vice-president with the firm.

Testifying as a government witness in the U.S. vs. IBM antitrust trial, Hindle told the court DEC changed the console appearance of these machines to accommodate office environments and adopted languages such as Dibol, Basic and Cobol to enable the processors to handle business applications.

And, to make the PDP-10 more competitive with IBM's medium range of 360 machines – chiefly the models 30, 40 and 50 – DEC also improved the quality of that machine's batch-processing abilities. The 10 also acquired peripherals more acceptable in a business DP environment.

Thus "redone," the PDP-8, PDP-11 and PDP-10 became the Datasystem 300, the Datasystem 500 and the Decsystem-10, respectively, when introduced to the business DP market, Hindle said. The 300 runs on Dibol, the 500 on Basic and the 10 can accommodate Cobol, he added.

Concerned With Compatibility

In addressing this end-user market, DEC has also had to be more concerned with the degree to which its machines are compatible with each other, according to the vice-president. He told the court DEC "would like to extend the compatibility of its machines across family lines and plans to do so.

"This would give us a marketing advantage and would eliminate reprogramming when moving to larger machines," he said.

At present, he indicated the PDP-8 family is software-compatible upward, but not downward software-compatible, and not all of its peripherals are 100% compatible with every processor in this group.

The PDP-11 family is similarly software-compatible upward, but not compatible downward among its members. Peripherals on the PDP-11s are completely upward compatible and, to some extent, downward compatible.

COM Sales to Grow Through '79

SAN JOSE, Calif. – Although recent growth in the microfilm equipment market has not been as high as industry expectations, sales of computer output microfilm (COM) recorders, readers and reader/printers should increase through 1979, according to a report by Creative Strategies, Inc., a California-based market research firm.

The past five years, while not living up to expectations, have served to educate the potential user on the many advantages microfilm has to offer, the firm said.

Worldwide sales of COM recorders, readers and reader/printers by U.S. manufacturers should reach $496 million in 1979 from $139.2 million in 1974 for a compound annual growth rate of 28.9%, the report said.

Domestic consumption accounted for 77% or $107.4 million, of the 1974 total and will account for 69%, or $341.2 million, in 1979. The foreign market is growing at a slightly faster rate than the domestic market because of the rising interest in microfilm overseas.

COM recorder shipments of $52.2 million valued on an if-sold basis, in 1974 will increase 30.7% annually to $199 million in 1979, CSI predicted.

Alphanumeric COM recorders represented the largest segment of the COM market with 82% of the total value of recorder shipments in 1974, the study indicated.

The research firm predicted off-line units with a front-end processor will exhibit the largest growth in this sector.

Stromberg Datagraphix, Inc., with over 35% of the total COM installed base, competes with other major companies for the "middle ground" uses of COM, and Memorex Corp. is the leading manufacturer in the on-line segment, the report said.

At the high-precision micropublishing level, Information International has a major share of the market with Singer Micrographic Systems its only significant competitor.

COM manufacturers also compete on a larger scale with computer printer and CRT terminal manufacturers and currently command only 3% by value of the computer output market, according to the report.

Ryad 1040 Product Pitch Similar To Those of American Vendors

By Naney French
Of the CW Staff

WASHINGTON, D.C. – During the recent Control Data Corp.-sponsored display of the Ryad 1040, built in the German Democratic Republic, Robotron Director Fritz Wokurka described the products of the two nationally owned companies – Robotron and Zentronik – in terms much like those found in the product literature of U.S. computer and peripherals manufacturers.

"The name Robotron stands for modern and efficient electronic computing equipment," Wokurka's translator said.

"An experienced staff of qualified workers, engineers, scientists and economists" have succeeded in developing and producing "high-quality" products for use in all fields.

The operating system, OS/ES, guarantees to utilize the data processing system in an efficient way, he said, adding that the 1040 also boasts a "favorable price/performance proportion.

"We are aware that computer manufacturers are judged by the range of system-technical service offered," he said, adding that "it is an important prerequisite to solutions which are above average and are satisfying in the long run."

The company offers technical-economic consultations, shipment, installation and commissioning of system configurations, technological equipment, testing and measuring instruments, DP accessories and training at the training center of the company as well as comprehensive technical service.

Citing the now-familiar pitch of the satisfied user as testimony to the quality of the Robotron product, Wokurka's speech mentioned Soviet organizations such as the joint center of nuclear research in Dubna and the Institute of Space Research.

Tymshare to Purchase Division of Leasco

CUPERTINO, Calif. – Tymshare, Inc. has agreed to acquire the business and operations of the U.S. time-sharing division of Leasco Response, Inc., a subsidiary of Reliance Group, Inc.

Terms of the agreement called for the payment by Tymshare of cash based on the retention and growth of volume in future years.

The agreement marked Reliance's exit from the time-sharing business, having sold off its UK business to on-line Systems, Inc. of Pittsburgh, Pa.

Tymshare President Thomas J. O'Rourke explained that the move gives Tymshare entry into Cleveland and boosts its position in Pittsburgh.

The agreement does not call for an exchange of hardware, and O'Rourke said he plans to run the Reliance work on Tymshare's Xerox Corp. 940s.

Conversion from Leasco's Hewlett-Packard 2000s should not be too difficult, he said, since they use Basic, which is essentially a "subset" of the Superbasic Tymshare 940s use.

"Basically we bought the business and customers plus some people," he said.

John T. Leatham, Reliance's executive vice-president, said, "Reliance Group first entered the time-sharing business in 1969 as part of its program to provide a full line of computer-related services.

"However, operations failed to perform to expectations, and significant additional capital investment would have been required to continue operations into 1976 and beyond."

Interactive Data Buys FTS

WALTHAM, Mass. – Interactive Data Corp. has expanded into the area of on-line automation of back-office functions through the acquisition of Financial Transaction Services, Inc. (FTS), which will become the FTS Division.

"Our initial concentration will be in processing money transfers from overseas," according to Jack A. Arnow, Interactive's president.

FTS has developed a system that converts transfer instructions from the format developed by the Society for Worldwide Interbank Financial Transactions into a format for direct entry into the Clearing House Interbank Payment System of the New York Clearing House Association.

Fact Book Shows Trends

NEW YORK – The 1975 edition of *Electronic News Financial Fact Book & Directory*, published by Fairchild Books here, provides evidence of increasing mergers and the disappearance of many smaller, marginal firms from the industry.

The directory provides financial profiles on more than 825 publicly owned organizations, as well as details on personnel, divisions and product classification.

The 675-page fact book costs $75 from Fairchild Books, 7 East 12th St., 10003.

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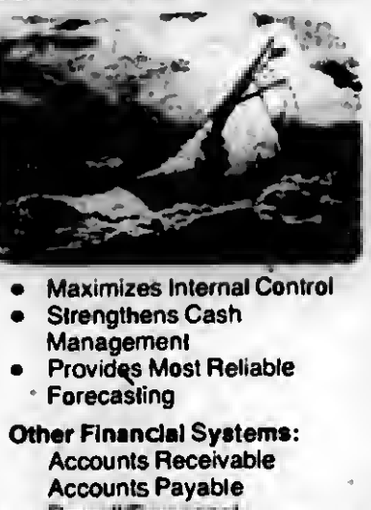
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Service Firms Report Quarter Results Up

Automatic Data Processing, Inc. (ADP) and Tymshare, Inc., two service firms making news with acquisitions, reported increased results for the quarter ended Sept. 30.

ADP achieved record revenues and earnings in its first quarter.

Revenues rose to $41.3 million compared with $34.6 million in the same period last year.

Earnings totaled $3.6 million or 51 cents a share compared with $2.9 million or 41 cents a share in the same period last year.

Results for the 1974 period were restated for the acquisition of Cyphernetics Corp. on a pooling-of-interests basis.

"We are encouraged by the results of the first fiscal quarter and are increasing our estimate of earnings per share improvement for the year to about 20%," President Frank R. Lautenberg said.

ADP has completed its acquisition of Financial Computer Services, Inc. of Fremont, Ohio, for nearly $2 million in cash, he said.

ADP also has signed a contract to take over the payroll DP business of Manufacturers Hanover Trust Co. and has agreed to acquire the Delos International Group, Inc. [CW, Nov. 26].

Tymshare had a 42% gain in earnings on a 20% increase in revenues for its third quarter over the same period last year. Results for the nine months were also improved.

Earnings totaled $1.2 million or 30 cents a share compared with $823,738 or 22 cents a share for the third quarter last year.

Revenues rose to $14 million for the quarter, up from $11.8 million for the same period last year.

The amounts for both quarters include the results of operations of United Data Centers, Inc., which was acquired by Tymshare in December 1974 and accounted for as a pooling of interests.

During the nine months, revenues climbed to $42.1 million compared with $34.4 million in the same period last year.

Earnings rose to $3.5 million or 91 cents a share compared with $2.4 million or 65 cents a share in the year-ago period.

End of Astros Drains MSI Quarter Net

COSTA MESA, Calif. – Reflecting charges resulting from its decision to abandon the Astros point-of-sale line and lower equipment sales, MSI Data Corp. showed a second-quarter loss of $1.3 million or 69 cents a share compared with earnings of $423,564 or 22 cents a share in the same quarter last year.

Revenues for the firm declined to $7.2 million in the three months ended Sept. 27 from the $8.4 million in the year-ago quarter.

The discontinuance of the Astros business resulted in an estimated $1.4 million loss after taxes, which was taken during the second quarter.

For the six months, revenues were nearly even at $15.4 million compared with $15.8 million in the year-ago period. Losses totaled $1.1 million or 23 cents a share compared with earnings of $742,250 or 55 cents a share.

During the 1974 period there was a credit of nearly $100,000 resulting from a change in accounting for applying overhead costs to inventories.

Equipment sales have been slow because of recessionary influences, according to W.J. Bowers, MSI president. Although MSI's order rate has been improving in recent weeks, total backlog at Sept. 27 was $8.6 million compared with $16.3 million at the same time last year, he noted.

The firm has maintained a positive cash flow and has reduced its outstanding bank loans from $10.5 million at the end of March 1975 to $3.9 million.

Wang Revenues Up in Quarter, Shipments Grow, But Earnings Dip

TEWKSBURY, Mass. – Although first-quarter revenues rose 15% at Wang Laboratories, Inc., the gain was not translated into increased earnings.

Earnings declined to $682,000 or 17 cents a share compared with $878,000 or 22 cents a share in the same period last year.

Revenues rose to $18.1 million compared with $15.8 million in the year-ago quarter.

During the period, the company's international shipments grew 24%, but a "substantial quantity of equipment was not shipped to our subsidiaries in time for reshipment by the end of the quarter," the firm said.

"Depletion of our production pipeline by record-breaking June shipments, coupled with summer vacations of production workers, caused a temporary production delay."

North American shipments grew about 10% and were very close to the quarter projections. Expenses for domestic operations were also in line with projections, the firm said.

The overall incoming order rate was up 5%, with international strength more than making up for a small drop in North American orders, according to the firm.

During the quarter Wang extended through 1978 its $24 million revolving credit agreement with four banks.

The company also bought an 81,000 sq-ft facility on six acres of land in Burlington, Mass.

During the quarter Wang was able to substantially complete the recall of the production employees laid off in December 1974, the firm said.

President An Wang said he views IBM's 5100 as greatly expanding the low end of the technical marketplace by bringing the benefits of computerization to the attention of many more potential customers and feels it will open many doors for broader sales of Wang's System 2200.

Quarter Results Sink at Graham

GRAHAM, Texas – Graham Magnetics, Inc.'s first-quarter revenues and earnings sagged below those of the year-ago period.

G.A. Jaggers, president, said sales were unusually low in July and August but that a "decided increase" began in September and continued in October.

For the quarter ended Sept. 30, the firm earned $183,942 or 20 cents a share compared with $279,974 or 30 cents a share in the year-ago period.

Revenues totaled $3.7 million compared with $3.9 million in the same period last year.

Jaggers said some of Graham's future products are being designed "to effect major savings for users in other industries . . . Our plan will be for continuing growth with increasing profits."

Decision Data Sags in Nine Months

HORSHAM, Pa. – Decision Data Computer Corp. reported losses for the third quarter and nine months, which President Loren A. Schultz attributed primarily to the continued deferral of orders by OEM customers.

In the third quarter, the firm lost $663,000 or 18 cents a share, including a charge of $192,000, compared with earnings of $413,000 or 11 cents a share in the same period last year.

The charge was a write-off of Decision Data's 15% investment in International Engineering Ltd.

Revenues for the quarter declined to $7.6 million compared with $10.8 million in the period ended Aug. 30, 1974.

For the nine months, however, revenues rose to $30.4 million compared with $27.9 million in the same period last year.

The loss totaled $170,000 or 5 cents a share compared with earnings of $824,000 or 22 cents a share in the year-ago period.

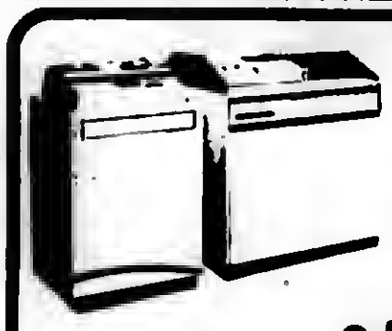
"Management is taking aggressive austerity measures to assure the company both weathers this difficult period and emerges stronger and better able to meet the challenges of the future," Schultz said.

First-Quarter Loss Expands at SEL

FORT LAUDERDALE, Fla. – Systems Engineering Laboratories, Inc. (SEL) showed increased losses during the first quarter ended Sept. 26, but the firm's president said the company still anticipates profitability for fiscal 1976.

The loss was anticipated, President A.G. Randolph said, and resulted from a phaseover in production from old to new product lines.

Revenues dropped to $2.8 million from $4.5 million in the same period last year while losses grew to $542,439 or 21 cents a share compared with $109,819 or 4 cents a share in the year-ago quarter.


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OATA OOCUMENTS, INC., 4205 S. 96th St., Omaha, Neb. 68127, manufacturer and retailer of OP installation supplies, filed to register $4 million of notes, Series A, due 1983, which are to be sold at 100% of their face amounts plus accrued interests. Underwriters are Chiles, Heider & Co., Inc., 1300 Woodmen Tower, Omaha, Neb. 68102.

OATA 100 CORP., 7725 Washington Ave. South, Edina, Minn. 55435, a manufacturer of remote data processing systems and batch terminals, filed to register 75,000 shares of common offered for sale by the company in exchange for outstanding common of Iomec, Inc. at the rate of one common share for each approximately 45 Iomec shares. An additional 5,000 shares will be issued in connection with the exchange offer. No underwriter is involved.

MCI COMMUNICATIONS CORP., 1150 17th St., N.W., Washington, D.C. 20036, a business and data communications firm, filed to register seven million shares of common and seven million warrants to purchase one share of common, to be offered for sale in units, each consisting of two shares of common and two warrants. Underwriters are Allen & Co., Inc., 30 Broad St., New York, N.Y. 10004.

Earnings Reports

COMPUTER AUTOMATION
Three Months Ended Sept. 28

	1975	1974
Shr Ernd	$.31	$.12
Revenue	6,586,397	5,136,982
Earnings	591,573	195,288

COMPUTER SCIENCES
Three Months Ended Sept. 26

	1975	1974
Shr Ernd	$.12	$.06
Revenue	53,546,000	42,546,000
Earnings	1,723,000	856,000
6 Mo Shr	.23	.10
Revenue	103,913,000	82,279,000
Earnings	3,247,000	1,441,000

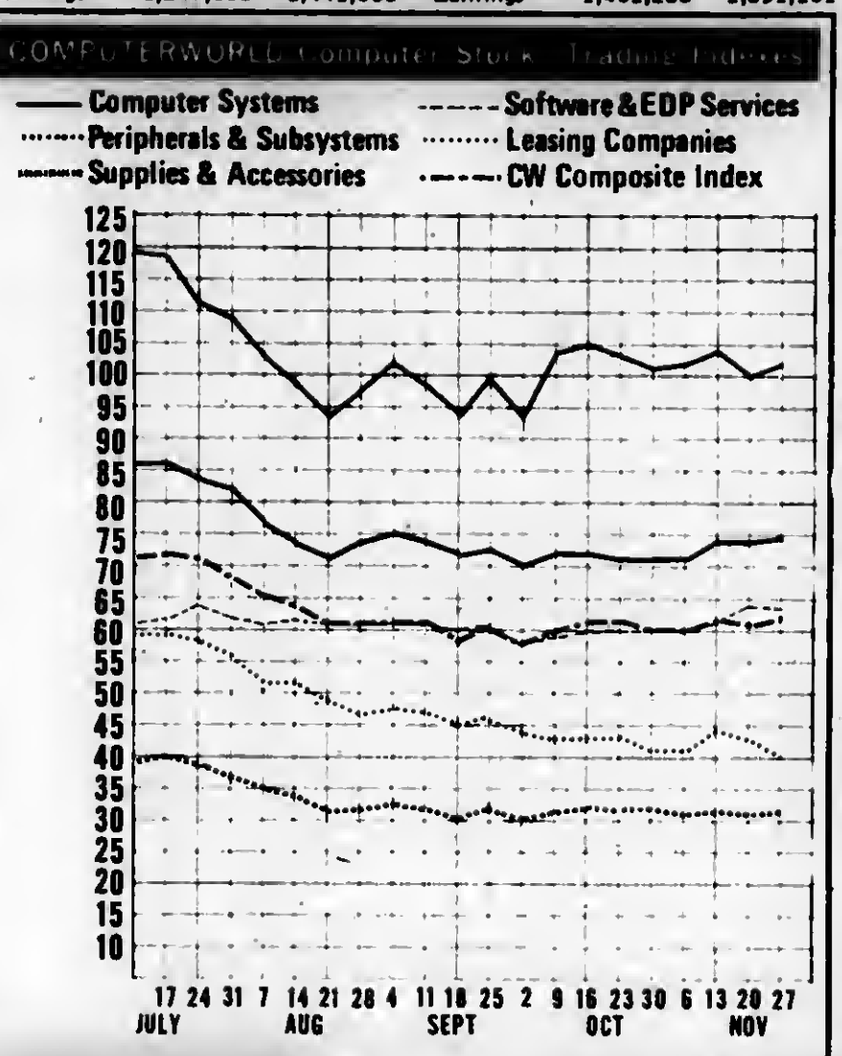
COMPUTER INVESTORS GROUP
Three Months Ended June 30

	1975	1974
Revenue	$7,213,919	$6,484,921
Loss	511,481	227,679

IBM
Three Months Ended Sept. 30

	1975 (000)	1974 (000)
Shr Ernd	$3.32	$3.23
Revenue	3,600,117	3,125,243
Earnings	495,245	477,273
9 Mo Shr	9.41	9.45
Revenue	10,368,447	9,387,021
Earnings	1,401,238	1,391,101

COMPUTERWORLD Computer Stock Trading Indexes



MOSTEK
Three Months Ended Sept. 26

	1975	1974
Shr Ernd	.....	$.09
Revenue	$9,396,898	15,170,328
Earnings	(660,677)	351,131
9 Mo Shr	.....	.93
Revenue	33,396,043	43,489,759
Earnings	(1,300,506)	3,683,491

NUCLEAR DATA
Three Months Ended Aug. 31

	1975	1974
Shr Ernd	$.03	$.24
Revenue	3,710,328	5,577,659
Spec Cred	39,000	98,000
Earnings	40,830	208,795
6 Mo Shr	.26	.56
Revenue	7,218,151	10,627,023
Spec Cred	123,000	186,000
Earnings	228,992	480,328

CENTRONICS DATA COMPUTER
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.45	$.38
Revenue	11,202,565	10,240,000
Earnings	2,142,802	1,810,000

ELECTRONIC MEMORIES & MAGNETICS
Three Months Ended Sept. 27

	1975	1974
Shr Ernd	.....	$.19
Revenue	$21,145,000	27,870,000
Tax Cred	.....	568,000
Earnings	(1,432,000)	1,311,000
9 Mo Shr	.....	.82
Revenue	70,043,000	85,487,000
Tax Cred	.....	2,298,000
Earnings	(1,692,000)	5,221,000

The company is in arrears on its preferred stock dividends.

BURROUGHS
Three Months Ended Sept. 30

	1975 (000)	1974 (000)
Shr Ernd	$.69	$.66
Revenue	367,712	346,710
Earnings	27,505	25,815
9 Mo Shr	2.31	2.08
Revenue	1,149,815	1,048,546
Earnings	91,571	81,121

GENERAL AUTOMATION
Year Ended July 31

	1975	1974
Shr Ernd	.....	$1.69
Revenue	$55,873,000	61,424,000
Earnings	(4,098,000)	4,305,000
3 Mo Shr	.....	.54
Revenue	14,481,000	20,057,000
Earnings	(1,558,000)	1,395,000

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Computerworld Stock Trading Summary

CLOSING PRICES TUESDAY, NOVEMBER 25, 1975

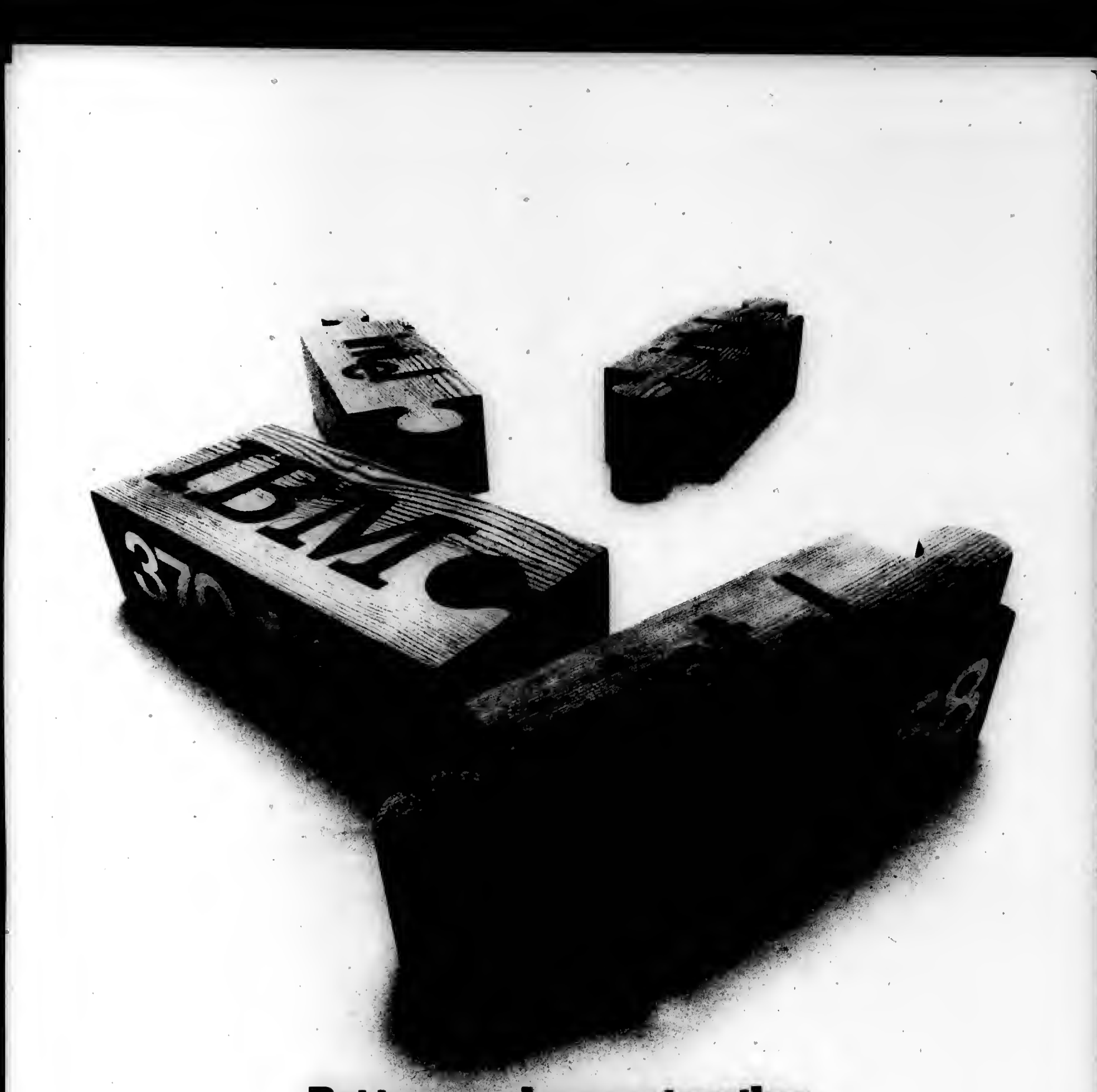
All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE (1)	CLOSE NOV 25 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	83 5/8	+2	+2.4
O	COMPUTER AUTOMATION	2- 11	9 7/8	- 1/4	-2.4
M	CONTROL DATA CORP	11- 23	19 1/4	0	0.0
M	DATA GENERAL CORP	10- 39	36 3/8	- 1/8	-0.3
O	DATAPOINT CORP	6- 26	23	- 3/4	-3.1
O	DIGITAL COMP CONTROL	1- 4	2	+ 1/2	+33.3
N	DIGITAL EQUIPMENT	46-140	132 3/4	+2 1/2	+1.9
N	ELECTRONIC ASSOC.	2- 3	2 3/8	- 1/8	-5.0
A	ELECTRONIC ENGINEER.	5- 10	7 3/4	+ 1/4	+3.3
N	FOXBORO	23- 42	28	- 1/4	-0.8
O	GENERAL AUTOMATION	4- 14	4 7/8	+ 1/4	+5.4
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	58-120	95 3/4	+ 1/0	+0.1
N	HONEYWELL INC	22- 40	34 1/8	+ 7/8	+2.6
N	IBM	158-225	224 5/8	+5 1/8	+2.3
O	MEMOREX	1- 10	8 1/2	0	0.0
O	MICRODATA CORP	2- 8	7 7/8	+ 1/2	+6.7
O	MODULAR COMPUTER SYS	5- 19	10 1/4	-1 1/2	-12.7
N	NCR	15- 39	25 1/4	+1 1/2	+6.3
O	PRIME COMPUTER INC	2- 6	4 1/4	0	0.0
N	PERKIN-ELMER	16- 30	26	+ 1/2	+1.9
N	RAYTHEON CO	26- 59	46	- 1/4	-0.5
N	SINGER COMPANY	9- 17	10	+ 1/4	+2.5
N	SPERRY RAND	26- 49	41 3/8	- 7/8	-2.0
A	SYSTEMS ENG. LABS	1- 5	4 1/4	+ 3/8	+9.6
N	VARIAN ASSOCIATES	7- 18	12 3/4	0	0.0
N	WANG LABS.	7- 17	10 3/0	- 1/4	-2.3
N	XEROX CORP	50- 86	51 5/8	+1	+1.9
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	3 3/8	0	0.0
A	COMMERCE GROUP CORP	2- 4	2 1/2	+ 1/4	+11.1
A	COMPUTER INVSTRS GRP	1- 2	5/8	+	+10.0
N	CATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	0- 1	3/0	- 1/4	-40.0
N	DPF INC	3- 6	4 1/2	0	0.0
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 3/4	+ 1/0	+4.7
N	ITEL	3- 9	6 1/8	- 1/8	-2.0
N	LEASCO CORP	4- 8	5 1/2	+ 1/4	+4.7
O	LEASPAC CORP	1- 1	1/4	+ 1/8	+100.0
O	LECTRO MGT INC	1- 1	1/0	0	0.0
O	NRG INC	0- 4	1/2	+ 1/0	+33.3
A	PIONEER TEK CORP	2- 7	5	- 3/8	-6.9
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	7	- 3/8	-5.0

EXCH		1975 RANGE (1)	CLOSE NOV 25 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	1	- 1/8	-11.1
A	APPLIED DATA RES.	1- 10	1 5/8	- 3/8	-18.7
N	AUTOMATIC DATA PROC	29- 65	59 1/4	+ 1/4	+0.4
O	BRANDON APPLIED SYST	1- 1	1/8	- 1/8	-50.0
O	COMPUTER DIMENSIONS	2- 6	3 1/2	0	0.0
O	COMP ELECTION SYSTMS	3- 7	5 1/2	- 1/4	-4.3
O	COMPUTER HORIZONS	1- 1	5/8	0	0.0
O	COMPUTER NETWORK	1- 3	2 3/4	0	0.0
N	COMPUTER SCIENCES	2- 6	4 1/4	0	0.0
O	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
O	COMPUTER USAGE	2- 4	2 3/8	+ 1/8	+5.5
O	COMSHARE	3- 4	3	- 1/8	-4.0
O	DATATAB	1- 2	1 1/8	+ 1/4	+28.5
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	13 3/0	+1	+0.0
O	INFORMATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
O	KEANE ASSOCIATES	2- 3	2 5/8	+ 1/8	+5.0
O	KEYDATA CORP	2- 4	3 1/2	+ 5/8	+21.7
O	LOGICON	3- 5	3 3/8	0	0.0
A	MANAGEMENT DATA	1- 3	1 5/8	- 1/8	-7.1
A	NATIONAL CSS INC	6- 14	10 3/4	0	0.0
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	13 3/4	+ 1/4	+1.8
N	PLANNING RESEARCH	2- 6	3	0	0.0
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	4 5/8	0	0.0
O	REYNOLDS & REYNOLD	10- 24	13 3/4	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/8	- 1/8	-10.0
O	TYMSHARE INC	7- 21	19 3/4	- 3/0	-1.8
A	URS SYSTEMS	2- 4	3	0	0.0
N	WYLY CORP	2- 4	3	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	9 1/4	+ 7/8	+10.4
O	ADVANCED MEMORY SYS	1- 7	4 1/2	+ 1/8	+2.8
N	AMPEX CORP	3- 7	5	- 1/4	-4.7
O	ANDERSON JACOBSON	1- 3	1 7/8	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 5	3	0	0.0
A	BOLT,BERANEK & NEW	5- 13	7 1/4	- 1/8	-1.6
N	NUMBER-RAMO	4- 8	3 7/8	+ 1/0	+3.3
A	CALCOMP	4- 7	3 1/2	0	0.0
O	CAMBRIDGE MEMORIES	1- 5	1 3/4	+ 1/8	+7.6
N	CENTRONICS DATA COMP	7- 25	20 1/4	+ 7/8	+4.5
O	CODEX CORP	15- 38	37 1/2	+ 1/4	+0.6
O	COGNITRONICS	1- 2	3/4	- 1/0	-14.2
O	COMPUTER COMMUN.	1- 2	1	+ 1/8	+14.2
O	COMPUTER CONSOLES	3- 7	3 3/4	0	0.0
A	COMPUTER EQUIPMENT	1- 2	1 3/8	0	0.0
O	COMPUTER MACHINERY	1- 2	3/4	0	0.0
O	COMPUTER TRANSCEIVER	1- 2	7/8	0	0.0
O	CONTEN	2- 5	4	+ 1/4	+6.6
N	CONRAC CORP	12- 30	29	- 1/4	-0.8

EXCH		1975 RANGE (1)	CLOSE NOV 25 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 3	1 3/4	0	0.0
O	DATA 100	5- 16	9 7/8	- 1/4	-2.4
A	DATA PRODUCTS CORP	2- 6	4 1/8	- 1/8	-2.9
O	DATA TECHNOLOGY	1- 3	1 3/8	0	0.0
O	DATUN INC	1- 2	3/4	- 1/8	-14.2
O	DECISION DATA COMPUT	2- 7	2 1/4	- 1/2	-18.1
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DIAN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	1 3/8	+ 1/8	+10.0
O	FABRI-TEK	1- 1	3/4	+ 1/8	+20.0
O	GENERAL COMPUTER SYS	1- 2	1 1/2	+ 1/2	+50.0
N	HAZELTINE CORP	3- 6	3 1/8	- 3/8	-10.7
N	HARRIS CORP	18- 33	32 3/4	+1 1/2	+4.7
A	INCOTERM CORP	3- 12	9	+1 1/4	+16.1
O	INFOREX INC	7- 5	2 3/4	- 1/4	-8.3
O	INFORMATION INTL INC	8- 14	12	0	0.0
A	LUNOV ELECTRONICS	3- 6	5 3/8	+ 1/4	+4.8
O	MANAGEMENT ASSIST	1- 1	1/2	0	0.0
A	NILGO ELECTRONICS	8- 24	16 3/4	+ 1/8	+0.7
N	MOHAWK DATA SCI	1- 5	3	+ 1/8	+4.3
O	OPTICAL SCANNING	1- 3	2 5/8	0	0.0
O	PENRIL CORP	2- 2	1	+ 1/4	+33.3
O	PERTEC CORP	2- 8	3 7/8	- 1/8	-3.1
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1/2	0	0.0
O	QUANTOR CORP	2- 6	4 1/4	+ 1/4	+6.2
O	RECOGNITION EQUIP	2- 9	6 1/8	0	0.0
N	SANDERS ASSOCIATES	3- 11	6 3/4	- 3/8	-5.2
O	SCAN DATA	1- 3	1 1/4	0	0.0
O	STORAGE TECHNOLOGY	6- 17	10 1/4	- 1/2	-4.6
O	SYCOR INC	5- 22	18 1/4	-1 3/4	-8.7
O	T BAR INC	3- 6	6 1/4	0	0.0
O	TALLY CORP.	1- 5	2 5/8	+ 1/4	+10.5
O	TEC INC	1- 4	2	0	0.0
N	TEKTRONIX INC	18- 44	44 1/4	+1 5/8	+3.8
N	TELEX	1- 3	2	0	0.0
O	WANGCO INC	4- 9	7 1/2	+ 1/8	+1.6
O	WILTEK INC	1- 4	1	- 1/2	-33.3
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 1/2	0	0.0
A	BARRY WRIGHT	5- 7	5 3/8	0	0.0
O	CYBERNATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	31 5/8	-1 1/8	-3.4
O	DUPLEX PRODUCTS INC	12- 25	16 3/8	+ 3/8	+2.3
N	ENNIS BUS. FORMS	5- 7	5 1/2	- 1/4	-4.3
O	GRANAM MAGNETICS	5- 10	9 3/4	- 1/4	-2.5
O	GRAPHIC CONTROLS	8- 21	13	0	0.0
N	3N COMPANY	43- 68	61 1/4	+1	+1.6
O	MOORE CORP LTD	39- 51	48 3/4	+ 1/2	+1.0
N	NASHUA CORP	9- 22	10 3/8	- 1/8	-1.1
O	STANDARD REGISTER	11- 20	16 1/4	0	0.0
O	TAB PRODUCTS CO	4- 8	5 1/4	+ 1/2	+10.5
N	UARCO	17- 24	21	- 3/8	-1.7
O	VANIER GRAPHICS CORP	4- 7	5	+ 1/4	+5.2
A	WABASH MAGNETICS	3- 5	3 3/4	- 1/8	-3.2
N	WALLACE BUS FORMS	15- 25	18	+ 3/8	+2.1

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CW News Update

NEWSPAPER

Car Listed as Stolen

Man Killed After DP Crime Check

By Nancy French
Of the CW Staff

TALLAHASSEE, Fla. – A Brevard County official on the way to his father's funeral was shot and killed near here recently by a Florida state trooper who mistook his car for a stolen vehicle after checking with the state's crime computer.

The victim's auto bore a license number identical to another issued for the year 1971 which was still in the state's active stolen vehicle data base.

Such numerical duplications are routine here because new tags with the same numbers but different colors are issued to different drivers every year, officials said.

Trooper Robert Rennie Jr. did not realize the "hot" tag was a 1971 number, not one valid for 1975, observers said.

Information is being withheld in the case pending the outcome of a coroner's inquest to determine whether charges should be brought against the trooper, but some details are available.

When Rennie spotted him, Frank D. Booth, the victim, was parked on the shoulder of the highway, apparently composing himself in the face of his grief over his father's death, according to an associate at the Brevard County Emergency Employment office, where Booth was director.

The trooper radioed a routine inquiry on Booth's license tag number via his two-way radio to a radio dispatcher with access to the state's criminal justice information system.

The computer printout produced at the dispatcher's terminal indicated a car with that tag had been stolen in 1971. The record also provided such data as the Vehicle Identification Number (manufacturer's serial number), the year, make and model of the stolen automobile, its color, number of doors, state of registry, date stolen and the date the record was entered.

Although Booth's car was a recently purchased 1975 Chrysler with an orange-on-white license plate issued in 1974 and validated with a 1975 decal, Rennie believed the car to be stolen and approached the vehicle with his .38 caliber magnum pistol loaded and cocked, according to Patrol Commander Eldridge Beach. In the confusion that ensued, Booth was shot and killed.

Tag Year Important

In Florida, vehicle identification is determined not only by tag number, but also by the year the tag was issued. The year is indicated by the color of the plate, according to Ralph Davis, director of the state's Department of Highway Safety

(Continued on Page 4)

Bid Case Defendents To File for Dismissal

By Naney French
Of the CW Staff

JERSEY CITY, N.J. – Defendants in a case in which an IBM employee and various city officials were charged with conspiracy to thwart competitive bidding on a computer contract [CW, Oct. 8] will ask for dismissal of the charges here soon.

Sources close to the conspiracy case said the defense will file the motion asking for dismissal of grand jury charges on grounds of "selective prosecution."

A story published recently by the *Jersey Journal* said the motion will contend that Jersey City is not required to have public bidding on its computer services contracts and therefore cannot be guilty of violating bidding statutes.

To support the motion, the defense will note that neither Bayonne nor Hudson County solicited bids for their computer systems, yet neither was prosecuted.

A Hudson county grand jury indicted IBM, one of its employees, five city offi-

(Continued on Page 2)

Jurisdiction Question Stalling U.S. vs. AT&T

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – While the trial of the government's antitrust suit against IBM has managed to get off the ground in the course of this year, U.S. vs. AT&T et. al. may never fly.

Filed a little more than a year ago on Nov. 20, 1974, the government's action – which charges the Bell System with monopolizing the telecommunications common carrier industry – has not progressed beyond the question of whether the U.S. District Court for the District of Columbia here has the right to hear the case.

First raised by the judge hearing the suit last February, this question of jurisdiction has been the only topic for public discussion during 1975.

Judge Joseph C. Waddy asked whether this district court could try the case since a similar action brought by the government against the Bell System in 1949 was terminated by a consent judgment in 1956 in the U.S. District Court for the District of New Jersey.

In addition to wondering if the New Jersey court should hear the present case as well, Waddy suggested the Federal Communications Commission (FCC) and other state regulatory bodies might have jurisdiction over these matters rather than

(Continued on Page 2)

Tandem Multiprocessor System Designed for 'Nonstop' Operation

By Patrick Ward
Of the CW Staff

SANTA CLARA, Calif. – Tandem Computers, Inc. said it has an answer for transaction-oriented network users who feel they have to install dual mainframes to make sure their network will stay up.

Tandem has developed a modular, multiprocessor system designed to support up to 1,000 terminals without interruption, even if some of its components fail, the company said. The system will interface with terminals selected by the user.

Priced from $65,000 to $1 million, the Tandem 16 Nonstop system is said to cost less than pairing two mid-scale computers and comes with a prewritten, general-purpose operating system, a spokesman said.

The system is intended for sophisticated users who will write their own applications software in a higher level language, he added. An alternative approach would be to use a third-party applications software vendor.

Nonstop is an assembly of modules "configured so that whenever any one module that is necessary to assure Nonstop operation fails, there is a redundant module to take over automatically," the spokesman noted. The user can expand the Nonstop system without rewriting application software, he added.

A Nonstop system can consist of two to 16 32K 16-bit processors interconnected

(Continued on Page 4)

Study That Halted N.Y. Lottery Charges DP Security Deficiencies

By Nancy French
Of the CW taff

NEW YORK – Gov. Hugh L. Carey has ordered a complete overhaul of the state lottery here and dismissed the lottery's director, Jerry Bruno, and his entire 325-person division.

The action came after a study by an independent management consulting firm found "security problems," "organizational problems" and "needless opportunities for fraud" in the lottery's operation, including the DP department.

No actual fraud was found, however.

The troubled lottery operation was suspended two months ago after it was found duplicate numbered tickets had been printed by the State Racing and Wagering Board's computer for a special Halloween drawing [CW, Nov. 18].

Arthur D. Little, Inc. (ADL) of Cambridge, Mass., which was asked by the governor to audit computer operations, identify deficiencies and recommend corrective action, cited the shortcomings of the lottery operation in a comprehensive report.

In announcing his decision, the governor said as many staff members as possible will be assigned to other jobs, but "in light of the state's current fiscal situation" there was no alternative to layoffs once the lottery failed to produce its own revenues.

Refunds are being made to some ticket holders, and some special drawing will be announced, he said.

The lottery will be totally reorganized along the lines of those operated in Massachusetts and some other states, and new systems analysts and computer programmers are being sought to develop the new system, Carey said.

The error that eventually brought the

(Continued on Page 3)

25 Packages Make Honor Roll

By Don Leavitt
Of the CW Staff

DELRAN, N.J. – Twenty-five packages have been named to the 1975 Software Honor Roll as a result of Datapro Research Corp.'s third annual survey of users.

Each package earned an average rating of excellent in overall user satisfaction and met other qualifying criteria, the research organization said.

Systems software dominated the list, with application-oriented packages accounting for only three of the top 25 spots. The same pattern has appeared in all three Honor Rolls Datapro has compiled.

Similarity in the Honor Rolls extended to the specific packages as well, with nine of the 25 entries appearing on the roll for the third straight year. Another five maintained the place of honor they earned first last year.

The survey form was mailed to 26,000 DP executives and invited them to rate any packages they had acquired from their mainframe vendors or from independent software houses. Just over 2,800 responded to that part of the survey, rating 1,400 packages.

The Honor Roll was put together out of those packages rated by at least six users. The rating form provided a four-point scale on a number of points including overall satisfaction, throughput/efficiency, ease of installation, ease of use, documentation and vendor's technical support.

Each of the possible ratings was assigned a weight, from 4 for excellent down to 1 for poor. The number of ratings at each level multiplied by its weight provided the weighted average for the category.

In addition to having an average overall user satisfaction rating of 3.5, each package had to have average ratings of

(Continued on Page 4)

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DP-Aided Journalism Reaps $1 Million

By Patrick Ward
Of the CW Staff

ALBANY, N.Y. – Journalists and DPers on the staff of the *Knickerbocker News* here pooled their skills recently to produce a detailed series of articles on delinquent tax accounts in Albany County.

A month after the five-part series appeared, the county received over $1 million of its back taxes. This represented a "quick surge" over the previous rate of payments, according to reporter Gene Weingarten.

Without the help of the newspaper's IBM 370/125, researching the stories "would have been too time-consuming, expensive and probably impractical," according to Steve Kent, executive city editor.

The project appealed to the news staff because property owners owed the county some $20.6 million in unpaid taxes, the largest amount in the state outside of New York City.

However, the county tax records were filed by street address only on thousands of record cards. Writing the series from data in this form "would have taken months and dozens of people," Kent said.

At this point the news staff enlisted the aid of the newspaper's DP department, whose 370/125 processes the paper's payroll and other business applications.

The *Knickerbocker News* photostatically copied the public tax payment records and spent 33 man-hours keypunching the relevant data.

John L. Burns, the newspaper's manager of advanced systems, then wrote an RPG program which broke the data down into categories for reporters Weingarten and Arlene Bigos, who wrote the series.

"It allowed us to correlate all the information by people's names," Kent explained. The computer system also produced a breakdown of delinquent properties by ward so the *Knickerbocker News* could run a multicolored map showing the level of delinquencies in various areas.

Other breakdowns included lists of delinquent properties by street and town; property owners who owed more than $5,000 in delinquent taxes; and taxpayers who owed more than $100, more than $500 and more than $1,000.

The *Knickerbocker News* staff now plans more computer-aided projects, including surveys of how state legislators stand on particular issues.

With the help of the computer, the newspaper will be able to easily break down the responses to see, for example, how "Downstaters" compare with "Upstaters," on a particular issue.

This will help the newspaper's coverage of voting patterns on major state issues, Kent said.

Correction

The third paragraph of Herbert S. Bright's "Simulation Confirms Proposed Encryption Algorithm" [CW, Nov. 19] should have read:

"Unauthorized recipients of the cipher who may have the algorithm but who do not have this key cannot derive the original data. A standard algorithm based on a computer-generated key thus provides a basis for compatible cryptographic protection of computer data while preventing unauthorized use of data in cipher form."

The author, for his part, noted there are 512 entries in the "S-box" substitution cipher tables, not 256 as stated toward the end of his article.

Complete output from the test runs is availble from Computation Planning, Inc., 7840 Aberdeen Road, Bethesda, Md. 20014.

N.J. Bid Conspiracy Defendents Reported Ready to Ask Dismissal

(Continued from Page 1)

cials and a bank official for "thwarting free, open and competitive bidding" and "overt acts" of conspiracy in order to win the contract for the city's computer system in violation of a New Jersey statute.

Identical Specifications

As evidence, the indictment alleged specifications in the city's request for proposal (RFP) issued on April 3, 1974, described "almost exactly" the characteristics of an IBM 370 system and related software packages.

Further, information for that RFP was provided by IBM employees interested in closing the contract, the indictment charged.

A source added that 90 items included in the 92 specifications for the new system were identical to IBM specifications.

The source said further that an IBM secretary, in secret testimony before the grand jury, said she typed the RFP under direction from an IBM salesman.

Indicted on charges of conspiracy and misconduct in office were: Peter Korn, former Jersey City business administrator; Joseph Cahill, the city's former finance director; and Walter Happell, former DP director.

Eugene Josephs of IBM and Roger Forsyth, an executive of First Jersey National Bank, were charged with obstruction of justice.

Question Stalling U.S. vs. AT&T

(Continued from Page 1)

the courts, according to the Communications Act and other federal and state regulatory statutes.

When the government first filed its complaint last year, lists of companies in the telecommunications field that were to be deposed were drawn up and discovery of documents within AT&T and the government was begun. But all such discovery has been suspended pending a decision on whether the District of Columbia court has jurisdiction.

Last March, both the government and AT&T filed memoranda on the subject with the judge. The government argued Waddy and his court do have the right to hear the case under Section 88 of the Sherman Antitrust Act.

AT&T, however, contended the matter would best be decided by Congress, the FCC and state regulatory agencies. Neither party suggested the action belongs with the Federal District Court for New Jersey.

In August, the judge invited the FCC to participate as "a friend of the court" or "amicus curiae," filing a memo on the question of jurisdiction. The FCC has requested two extensions for submitting this brief.

At present, the document is due Dec. 15, and the parties have asked to file briefs in response during January.

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In Reviewing Program Error

Consultants Hit N.Y. Lottery for Poor Design, Control

By a CW Staff Writer

NEW YORK – In reviewing the program error that led to the suspension of the New York State lottery here, Arthur D. Little, Inc. (ADL) found the problem was symptomatic of a "poorly designed, implemented, controlled and managed lottery."

No single individual or organization controlled all the resources needed to operate a successful lottery, a report by ADL said.

Within the lottery division itself, there is no computer programming capability, no procurement, personnel or finance capability.

Persons who perform these functions report to the Director of Administration for the Racing and Wagering Board in New York City, rather than in Albany where the division is located.

Computer operators who work for the Department of Taxation and Finance are paid from lottery funds, report to the head of DP within the Administration Division of the Racing and Wagering Board and are supervised by DP shift supervisors who work for the Department of Taxation and Finance.

There is a general absence of written instructions for initiating computer actions and no formal review to assure instructions are implemented.

Only one individual currently understands all the computer programs used for the lottery. Suppose he left?

Decisions to introduce new lottery games were made with no analysis of the implications such steps might have in terms of operating procedures.

No "checklist" was used to review and promulgate changes in the rules and regulations before offering a new game.

Paper stock was purchased on a price-bid basis, without assurance that paper stock and inks used could not be duplicated elsewhere.

Production of counterfeit tickets requires only two things – the code, which was found to be relatively unsophisticated, and some paper stock.

The lottery's typeface is widely used and posed no problem to the would-be counterfeiter.

Identical algorithms were used for three different games. A set of "seed numbers," used to make the algorithm perform its computations for a particular set of tickets, was neither reviewed nor changed for the special games.

No "lock-out" feature was used for an extended period of time, to prevent the computer from printing unauthorized tickets.

No controls over unauthorized ticket printing were established either by using appropriate stock control or by keeping critical programs, stored on magnetic tapes and disks, out of the computer room when not in planned use.

Study Leads to Halt Of N.Y. State Lottery

(Continued from Page 1)

Oct. 22 halt of lottery operations occurred as a result of a decision to distribute only 4 million rather than the usual 5 million tickets for which the computer program had been designed and previously used, the ADL report said.

The Colossus-Halloween Special lottery number had seven digits divided among three boxes, according to the report.

Box A held one digit – the pool or series digit – which in a run of 5 million tickets ranged from one to five. In this case, since only four million tickets were being printed, the number in Box A should have been one, two, three or four.

To add still another dimension to the numbering problem, agents wanted to be able to sell players tickets from each of the four pools rather than having all their tickets from one series. To do this, the lottery devised a scheme to randomize the print order so that each agent received a packet with tickets from each of the four pools.

Although the scheme was properly executed in the prior Colossus games, it was not modified correctly for the Oct. 31 Halloween game, the report said.

On Sept. 16 a programmer employed by the Racing and Wagering Board, which provides computer services to the Lottery Division, was instructed to change the program so it could be run later that day to print 4 million tickets rather than 5 million as were previously produced.

The programmer made the changes he thought necessary and instructed the computer operator to produce the tickets.

However, he failed to modify the program instructions appropriately, which led to the assignment of the digit 5 in Box A even though there were only four pools of 1 million each produced, ADL said.

Moreover, the programmer failed to modify his key numbers for special games which led to the assignment of duplicate and triplicate numbers.

ADL said 100,000 tickets with a 5 in Box A were printed.

In addition, 900,000 duplicates (1.8 million tickets) and 500,000 triplicates (1.5 million tickets) out of the 4 million tickets were printed, according to the ADL report.

ADL Recommendations

Although it is "impossible to eliminate human error," organizations need procedures and controls that reduce the likelihood of such errors, and such controls were "virtually nonexistent" within the computer sections, the report said.

Only limited tests of the revised program were performed before the decision to print was made, and these tests were performed by the programmer himself, the report said.

The program was not reviewed by the programmer's supervisor nor by anyone else. Further, the order to print the tickets was apparently given informally by the programmer acting under the instructions of his supervisor.

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Fla. Man Killed After Trooper Checks DP Crime Bank

(Continued from Page 1)

and Motor Vehicles.

"If your number was '123' last year, this year you could get '856,'" he explained. "It doesn't matter who had '856' last year."

When asked if anyone ever considered deleting "hot" numbers from their series or creating a truly unique numbering system, Davis said, "Why should we? What difference is it to us?

"The new tags have been a different color every year until this year," he added. "Some years they are blue, other years they're green. This year's tag is orange.

"Any police officer knows an orange tag would not have been issued in 1971," he said.

However, despite the fact that it takes two criteria – the plate number and year issued – to correctly identify a vehicle, a police inquiry into the state criminal justice information system can indicate a "hit" without that second identification criteria, Gil Rodrigues, second in command at the Florida Crime Information Center, admitted.

Had both the year and the tag number been required to access the file, Booth probably would be alive today because Rennie's query would have found no record in the stolen vehicles file. He could have approached the parked vehicle without fear, a police officer said.

Under the circumstances, however, he was prepared for the worst and, "in a one-on-one situation like that, a trooper is entitled to protect himself," the officer said.

At this time officials will not speculate on how much data from the stolen vehicles records actually was provided to Rennie over his two-way radio.

In such cases it is customary for the communications officer to simply say "the car is hot" or "it's a hit" without a lot of other details, the police officer added, noting the record is actually short enough to read to the querying trooper or police officer in its entirety.

Tapes of the conversation will be played at the inquest, Rodrigues said.

While there is no way to determine just how many records of vehicles stolen prior to 1975 are still in the Florida Crime Information Center's data base without dumping the records, Rodrigues said "there is a high percentage."

All vehicles that were not recovered in past years are still in there, he said.

NCIC Not Involved

Because the tag involved was a Florida tag in Florida, it was not necessary for the inquiry to go to the National Crime Information Center (NCIC) in Washington, D.C., and an NCIC official confirmed that this particular inquiry did not go there.

However, since the stolen vehicle record was still in Florida's files and since state law enforcement officials are responsible for inserting and deleting such files, that record is without doubt in the NCIC file as well, he added.

"It is surprising Booth wasn't stopped much earlier since apparently the tag had been on his car since 1974," the NCIC official observed.

Rennie has been suspended pending the outcome of an investigation and the coroner's inquest, Patrol Commander Beach said.

"We have deep sympathy for Mr. Booth's family, but we're also not going to throw the trooper to the wolves until we find out what happened," he added.

The issue before the coroner's jury will be whether the use of force by the trooper was justifiably excusable or not, an assistant state attorney said.

'Nonstop' Multiprocessor System Could Support 1,000 Terminals

(Continued from Page 1)

by a redundant Dynabus.

The Dynabus connecting the processors has a 20 Mbyte/sec transfer rate and built-in bus control for automatic switchover or disconnect in the event of a processor failure or a bus failure between two processors.

The main semiconductor memory offers a 500 nsec access time, including mapping and error detection and correction.

The optional core memory provides a cycle time of 800 nsec, including mapping and parity checking, Tandem said. Both the semiconductor and core memories are packaged on 32K boards.

One processor can support up to 32 dual-port controllers, the spokesman said. Each communications or terminal controller can handle up to 32 lines.

Each disk controller can handle up to four drives, from 10M bytes to 80M bytes in size, and each magnetic tape controller can handle two 800 bit/in. units, he added.

Tandem's Transaction Operating System (T/TOS) for the Nonstop system is a multiprogramming, multiprocessing virtual operating system.

A copy of T/TOS resides in each processor module so a processor failure won't limit system capability, Tandem said.

T/TOS allocates execution time to multiple programs on a priority basis and allocates buffer space and control blocks. It handles process synchronization; fault and trap handling; and interval clock maintenance.

Tandem said it expects to have five sales and service sites across the country when it starts delivering Nonstop systems in April. The company will maintain the systems itself, but will encourage customers to do as much maintenance and parts storage as they went.

Tandem is at 2909 Stender Way, 95051.

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25 Software Packages Make Datapro Honor Roll

(Continued from Page 1)

at least 2.8 in each of the categories.

Training provided by the software vendors was another category Datapro asked the executives to rate. Although these weighted averages were not included in the Honor Roll calculation, 20 of the 25 packages would have remained on the Honor Roll even if a 2.8 or better rating in training were required, Datapro said.

Other Misses

Twelve more packages would have made the Honor Roll, the researchers noted, "if a single user had made a single rating change in a single category." The required change would have had to be in an upward direction, although Datapro didn't stress that point.

Another 17 packages met all the qualifying criteria but were rated by only three to five users each. These were given honorable mention by the survey team.

Complete results of the survey – including detailed statistics on 12 packages rated by 50 or more users and 95 others rated by at least six – are available for $10 from Datapro at 1805 Underwood Blvd., 08075.

** Alltax – Management Information Service
DOS Automatic Spooling Asynchronous Processing (DOS Asap) – Universal Software, Inc.
** DOS Dump/Restore/Plus & Virtual Disk Utility – Westinghouse Electric Corp.
** DYL-250 – Dylakor Software Systems, Inc.
** Epat – Software Design, Inc.
* Fast Dump/Restore (FDR) – Innovation Data Processing, Inc.
Foresight – Foresight Systems, Inc.
1130/Fortran – DNA Systems, Inc.
** Grasp – Software Design, Inc.
IMSL – International Mathematical & Statistical Libraries, Inc.
Komand – Pace Applied Technology, Inc.
** The Librarian – Applied Data Research, Inc.
* Optimizer/Optimizer II – Capex Corp.
Pansort – Pansophic Systems, Inc.
** Panvalet – Pansophic Systems, Inc.
Problem Program Evaluator (PPE) – Boole & Babbage, Inc.
** Quikjob I, II & III – System Support Software, Inc.
Relo-Plus – Universal Software, Inc.
* RPG II for System 360/370 – IBM 1130/Sort – DNA Systems, Inc.
Syncsort – Whitlow Computer Systems, Inc.
* UCC One (formerly Tape Management System – University Computing Co.
** UCC Two (formerly Duo) – University Computing Co.
Watfiv – University of Waterloo, Ontario
Westinghouse Teleprocessing Interface System (Westi) – Westinghouse Electric Corp.

* Second consecutive year
** Third consecutive year

Twenty-five packages (listed alphabetically) make up the 1975 Software Honor Roll, according to Datapro Research Corp.

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By Limiting Disclosure

EFTS Law Seen Hurting Credit System

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – If legislation is passed that limits the disclosure of personal information held in electronic funds transfer systems, (EFTS) the exchange of data upon which much of the consumer credit system depends could be hindered.

That warning was made by Dr. Ruth Davis, director of the National Bureau of Standards' Institute for Computer Sciences and Technology, in a report prepared for the Privacy Protection Study Commission, which is looking into information practices in the credit industry.

Credit agencies may perceive the costs of providing security as "very burdensome" and may actually prefer to spend that money defending themselves against lawsuits rather than implementing privacy safeguards, she told the commission.

According to Davis, any system of information exchange between banks, retail organizations and credit agencies would require procedures and requirements to be applied to all uniformly.

If strong technological provisions were implemented in both EFTS and credit-reporting systems, could the needed data interchange take place? Davis asked.

Tend to Circulate

Basically, credit records are classed as a subset of intelligence records. They are normally kept private but tend to circulate within the concerned intelligence community, she explained.

"Banks, oil companies, department stores and other credit-granting organizations freely exchange information with credit-reporting organizations every time a credit check is performed, as well as on a more scheduled systematic basis," she noted.

In 1974, for example, "credit bureaus conducted about 150 million credit checks on individuals, with each check adding a small increment of data to the individual subject's record," she said.

While there are about 2,000 credit bureaus, only about 200 of these are automated. Most smaller bureaus maintain their own manual record systems locally and have access to larger systems when needed. These smaller systems are also valuable sources of input to the larger systems, she explained.

Since their primary aim is to sell information, the information supplied by the credit bureaus should be, under ideal conditions, accurate and complete since customers want to maximize sales to good credit risks and minimize bad credit losses.

Incompatibility of Aims

These basic aims of credit-reporting organizations do not necessarily mesh with privacy requirements, Davis said.

Credit agencies' "desire to sell information may result in a wider dissemination of data than the individual might prefer," she pointed out.

Further, their desire to maintain complete files may also result in maintaining data, especially if detrimental, for excessive periods of time.

In addition, many keep limited records of access to data. Each time a retail sales organization inquires about an individual's credit status, that valuable item of credit information is added to the file.

Subsequent records are also kept so that, by default, an inquiry without subsequent reporting of charge authorization is an indication credit was denied to the individual in that case, she explained.

CRTs Prove 'Ouchless' Patients

KANSAS CITY, Mo. – Computer-simulated pain is being used as a stand-in for the real thing for dental students at the University of Missouri here.

A computer-assisted diagnostic course contains seven cases, each simulating a patient with a toothache. The object is to teach students how to diagnose toothache pain.

"The cases are typical ones dentists see every day," according to Dr. Jack L. Stewart, assistant dean of the university's dental school. "The course is designed to sharpen a student's ability to diagnose problems, because a simple complaint like 'toothache' may have a deep-seated cause.

"Diagnosis and prescription require thorough study of the patient's problem, and the course helps develop effective treatment plans and techniques," he explained.

The diagnostic course is one of 12 computer-assisted courses offered by the dental school. Eight IBM 3270 visual display stations in the instructional resources library are used.

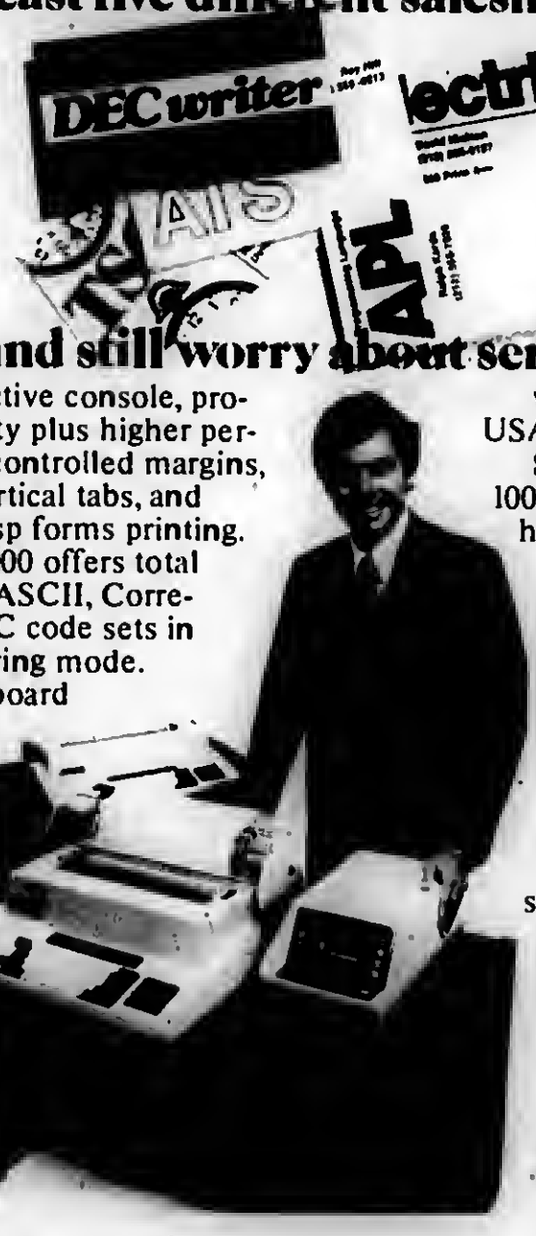
Supplement Studies

The courses supplement the regular dental studies and cover subjects ranging from biochemistry to jurisprudence and ethics. To study one, students type on a keyboard attached to the terminal the course desired, and study material is displayed.

Questions and answers are displayed in response to student commands and the system explains why an answer was accurate or not and refers the student to review material if the answer was wrong.

"The amount of material to be covered in the dental curriculum is enormous," Stewart said. The computer-assisted courses "educate a student by exposing him to many cases via simulation – more than he could otherwise cover in class or the clinic."

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Cbema, Patent Office Under Attack For Opposing Patenting of Software

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – The Computer and Business Equipment Manufacturers Association (Cbema) and the U.S. Patent Office have both come under sharp attack for arguments they presented to the U.S. Supreme Court opposing patenting of software.

The California Patent Law Association (CPLA) and Software Associates, Inc. (a small software firm in Altadena, Calif.) have both filed briefs as friends of the court contending that a number of inventions "based upon programming, whether it be software programming or hardware programming" deserve patent protection.

In its comments, Software Associates, Inc. told the high court that "Cbema relies on statements of foreign origin that, in fact, do not support its position against patenting, but instead support [a] position for patentability."

Broad Terms Used

Meanwhile, the CPLA noted Congress has defined classes of inventions that may be patentable "in very broad terms and has not excluded programming of computers and programmed computers as patentable subject matter."

The Patent Office "should not be permitted to change the law indirectly" by repeated petitions to the Supreme Court "in a way [a presidential commission in 1966] . . . failed to bring about directly" a change in the law by an appeal to Congress, the brief continued.

The Patent Office triggered the current outpouring of opinions when it petitioned the Supreme Court to review a finding of the Court of Customs and Patent Appeal [CW, May 14]. The lower court had found in favor of Thomas R. Johnston's application for a patent on an accounting system implemented on a general-purpose computer.

The high court is slated to hear oral arguments on the Johnston case this week.

Software Associates, Inc. "does not consider itself prepared to form a judgment as to whether or not the invention described and claimed [in Johnston's application] is unobvious over the prior art."

Describing itself as "familiar with many of the practices of the U.S. Patent Office" and with the Benson-Tabott decision in 1972 (in which a patent on an "algorithm" was disallowed), the company said it is "confused" by Benson-Tabott and "dismayed by the prospective costs and difficulties of obtaining a patent on an invention that is implemented by software programming."

Basing much of its argument on the equivalence of software and hardware programming, the brief noted that software-based simulation can cause one general-purpose computer to function like another. In effect, the simulation program turns the original hard-wired system into a new machine, and new machines are potentially patentable, it continued.

The association approaches the case on the side of Johnston because it believes patent protection "should be granted to any invention which satisfies the statutory criteria for patentable subject matter."

The patent attorneys' group argued strongly that Johnston's invention does create a new machine that meets those criteria in a real, concrete form and not just as an idea. It is not even a new use for an old machine, CPLA said.

Check Fraud Suspects Face Trial

By Patrick Ward
Of the CW Staff

LOS ANGELES – The alleged masterminds of an attempt to forge and cash stolen Los Angles Municipal Treasury check blanks [CW, April 23] are now facing trial here.

The city still faces an "$800,000-plus" negligence suit for failing to alert banks in March of 1974 when it learned that 17 numbered blanks used for computer check printing were missing from the city's Data Services Bureau (DSB).

Police still do not know how the missing blanks got into the forger's hands, Deputy District Attorney Stephen Trott said.

However, Joyce R. Williams, who allegedly led the check-forging operation, is currently on trial, he said. Richard Keats, who is alleged to have headed the check-cashing part of the scheme, was arrested last month, he added.

Two other men with lesser roles in the plot have already been sentenced to up to 14 years in prison. Police are still seeking the man who did the actual check forging; Trott said.

T. Tamaru, DSB general manager, has said he told city officials on March 17, 1974 that the 17 check blanks were missing.

However, the officials assumed the checks were just misplaced and that it was therefore unnecessary to warn banks or police, he said.

Though detectives said at least four checks were forged, only one was cashed.

This $902,000 check was first cashed at New York City's Crocker International Bank and the funds were then transferred through several European banks, finally reaching the Hollandische Bank Uni. N.B., The Netherlands.

Approximately $800,000 was withdrawn from the account there late last year, just before police put the bank under tight surveillance.

When that check returned to Los Angeles after being cashed, the city's computers rejected payment on it, since they lacked any authorization to do so.

The Banque de Paris of Geneva was left holding the bag for $800,000, Trott said. That bank now seeks $800,000 from the city for failure to alert the banking community when it learned the check blanks were missing, Trott said.

CUMREC '76 CALL FOR PAPERS

The program committee of the college and universities machine records conference is still accepting papers to be presented at Cumrec '76. The theme of the conferance is "sharing – key to the future."

Cumrec '76 will be hosted by the Southwestern Ohio Regional Computer Center and will be held in Cincinnati May 17-19 1976. Papers are due January 1, 1976. Call or send Intents to:

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CW1210

Simulation Used to Put Railroads Back on Profit Track

PHILADELPHIA – Part of a plan to reorganize seven bedridden northeastern U.S. railroads into a money-making operation has entailed building the largest "model railroad" in the world.

The model doesn't run on tracks, though – it runs on a computer system.

Engineered by Day & Zimmerman, a consulting firm based here, the model is a mathematical simulation of the operations of the Consolidated Rail Corp. (Conrail), which the U.S. Railway Association (Usra) has proposed to Congress.

The Conrail Analysis Model (Cram) consists of computer programs and data representing traffic, stations, classification yards, operating costs and revenues – and more than 30,000 miles of tracks.

The reorganization plan involves the Penn Central, Erie Lackawana, Reading, Central of New Jersey, Lehigh Valley, Lehigh & Hudson River and Ann Arbor railroads.

The model is, in effect, a very large data base operated by a team of specialists who use many complex computer programs to develop information from the data and organize this data in a variety of ways.

Because more than 5 million data elements are related to freight activities alone, for example, Day & Zimmerman turned to a large computer time-sharing service for necessary large-scale DP capability for storage and manipulation of the model.

Using keyboard computer terminals in its Philadelphia headquarters, the consulting firm's analysts could develop and debug their computer programs, enter data into the system and simulate the operations of Conrail under varying conditions.

The terminals are linked to a Computer Sciences Corp. Infonet data center in Chicago by a communications network of leased telephone lines and satellite circuits.

Day & Zimmermann has been building computerized models of railroad operations for about four years now, beginning with the firm's modeling assignment from the trustees of the Penn Central.

The early model enabled the trustees to experiment with the size of the 20,000-mile Penn Central rail system and develop relationships of network size to net operating income. The outcome of these studies suggested an optimized rail configuration of about 11,000 route miles.

Since then, the consulting firm has developed more definitive models for the trustees, adding passenger traffic; detailing car types, train types and commodity groups; and introducing location-specific costs.

Last spring Usra called on Day & Zimmermann to build Cram. The initials not only describe the model, but the deadline as well, Hugh Stewart, a vice-president of the firm said. The company finished "construction" in May and has been running the model through its paces ever since.

1,715 Segments

The 30,000 miles of track in the model have been broken down into 1,715 segments. Each segment has been labeled with its own mileage, curvature, grade, signaling, speed limits, ownership and the state in which it's located. The segments come together at 1,338 points (nodes) representing switching yards, stations, ownership boundaries and state lines.

Once the skeletal structure of the proposed configuration of Conrail was developed, Day & Zimmermann analysts began preparing a traffic base of historical data provided by Usra against which forecasts could be made.

The traffic base is comprised of more than 200,000 records of "load movements," including origin, destination, commodity, number of loads, net tonnage and the resulting revenue for the railroad. The data was applied to the model converting destination and origin into model codes.

In the next step, freight routing, the firm entered into the model Usra's plan for Conrail freight routes.

The analysts were then ready to load the trains and run them over the Conrail system to determine how much freight traffic – and revenue – would pass over each segment of track in a given forecast year.

Day & Zimmermann was able to analyze the effect of freight movements on such requirements as fuel, yard crews and track maintenance, with these statistics added to the data base.

At this point, all data was brought together in the final stage, cost analysis. Cost equations were applied to the figures in three major categories: costs directly related to activity levels such as fuel consumption, track maintenance and freight-yard operations; site-specific costs such as building maintenance and depreciation; and overhead costs.

If everything goes according to plan, including passage of the necessary legislation to remove many of the regulatory restraints on railroads, Usra said Conrail will turn its first profit – about $36 million – in 1979. It predicts a 1985 profit of $597 million.

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SOFTWARE ENGINEERING FOR MICROPROCESSORS

This course applies the philosophies and techniques of top-down design and structured programming to microprocessors. It shows how highly modular, reliable code can be written by "hand-compiling" logic written in pseudocode or by using existing languages. Cost: $300 Jan. 12-13, San Francisco; Feb. 23-24, New York City.

SURVEY & APPLICATION OF MICROPROCESSORS

This is a survey course of the currently popular microprocessors and their applications. It also teaches a set of design and programming techniques necessary for microprocessors. It points out many mistakes often made in microprocessor applications. A knowledge of programming is assumed. Cost: $300 March 8-9, Chicago; April 5-6, San Francisco.

HARDWARE FOR PROGRAMMERS

There now exists a generation of programmers who has very little familiarity with hardware. This intensive one-day seminar discusses processors, memories, channels peripheral devices at the level needed by the programmer to write more efficient applications. Cost: $150 Jan. 21, Los Angeles; March 10, Chicago.

TECHNIQUES FOR IMPROVING SYSTEM PERFORMANCE

This course gives you the technical background to design and carry out a variety of performance evaluation and optimization projects. Problems involving batch processing systems, transaction-driven systems and computer networks will be worked out. Course emphasis is placed upon the operational method of computer systems analysis. Cost: $450 Jan. 28-30, Ottawa; March 10-12, Washington.

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This course is intended as an overview of the terminology and technology of the "common carriers" (e.g. the telephone companies), the regulatory agencies, and the vendors of telecommunications hardware and software. It is intended for those preparing an on-line system, real-time system or any other system involving telecommunications. Cost: $300 March 11-12, New York City.

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Charts First 40 Days' Behavior

Team Develops Supernova Model Accurate Within 2%

By Catherine Arnst
Of the CW Staff

YORKTOWN HEIGHTS, N.Y. – A recently developed computer model which describes the general behavior of a star during the first 40 days efter it explodes and becomes a supernova is accurate within 2% when compared with actual observations.

The model, developed by Dr. Gordon Lasher, Dr. Alan Karp and Dr. Kwing Lam Chen et IBM's Thomas J. Watson Research Center, is different from others done and possibly more successful, Lasher said, because it is simpler.

"Others have tried to model the whole phenomena," he explained.

When compared with actual observations of 38 Type I supernovae, the model showed an "encouraging fit," Lasher seid. A Type I supernova is one in which the spectrum of the light emitted by the exploding star shows no evidence of hydrogen.

Lasher hopes the model will "give astronomers a handle on stellar evolution" by allowing them to work backward from the time a star explodes to find the cause of the explosion.

Although equations ere available that describe what a star is like at the end of its life, "they don't tell us precisely when a given star is going to explode," Lasher said.

"What this gives us," he continued, "is a start toward quantitative understanding of supernovae. In a sense we will get en idea of where we came from since all the heevy elements, including those in our bodies, are presumed by many astronomers to originate in supernovae."

The model was developed from a set of equations based on three parameters: the amount of energy released in the form of radiant energy by the collapse of the star's core; the mass of the expanding envelope of gas; and the initial density of that envelope.

It took approximately six months to design the program, which was written in APL and run on an IBM 360/91. The result was a roughly parabolic curve that fits the first month's record of the 38 observed supernovae. After this period, there is a tail-off of light emission for which there is no account.

If the model is a true picture, Lasher speculated, the initial burst of light from the exploding star should be preceded for an hour or so by a burst of soft X-rays. Such an X ray burst has not yet been observed, but "I have hopes that X ray observations will confirm this model," Lasher said.



Chan, Lasher and Karp (left to right) study computer model of supernova.

The reaction to the model has been generally favorable, Lasher said, although "we haven't convinced my competitors" who hold different theories, he said.

CRT Interviews to Detect Suicide-Prone Found 30% More Precise Than Doctors

By a CW Staff Writer

MADISON, Wis. – A computer interview designed at the University of Wisconsin to predict suicide risk is 30% more accurate than doctors in pinpointing suicidal patients, according to the results of a retrospective study.

And, of a sampling of 21 of these patients, 52% preferred being interviewed by a computer rather than by a physician, compared with 27% of 43 nonsuicidal patients.

Suicide is currently the 11th largest cause of death in the U.S. and the second leading cause of death for persons in the 15-29 age group.

"Roughly three-quarters of the people who kill themselves see a physician three months before they do it, but not always for that reason," according to Dr. John H. Greist, one of the interview's developers.

Doctors often are not sensitive to the suicidal person's "cry for help" or are reluctant to ask him about it, so the problem goes untreated.

Eliminetes Prejudice

The computer interview eliminates any prejudice or hesitation that a doctor might exhibit, asks questions and processes answers systematically and will never forget to ask any pertinent questions, Greist said.

"There are definite problems in predicting suicides as people are reluctant to talk about it, especially if it stems from deviant or problem areas of behavior. People tend to give indirect, inaccurate answers or understate the problem.

"Generelly, the more delicate the problem, the more the patients prefer a computer to a physician," he said.

"We realize the introduction of nonhuman devices into this sensitive clinical area will be criticized, but we would like to point out that use of machines is not necessarily inhumane," the developers of the program said.

The computer interview also avoids the problem of conservatism, in which humans underestimate the certainty of events. Studies have shown the computer interview consistently assigns a higher probability to its prediction than a doctor, Greist said.

Substitute for Psychietrist

Patients at the University of Wisconsin are interviewed at a CRT connected by telephone and acoustic coupler to either a Univac 1108 or a Digital Equipment Corp. PDP-11. Questions are drawn from a subjective data base containing 35 fectors and 246 levels of these factors.

"The computer models the very best composite psychiatrist," Greist said. The data base was developed from information provided by eight psychiatrists who were asked to list all the factors they took into consideration when evaluating patients with suicidal thoughts.

Veriables Important

Many variables may be important in predicting suicide, so "the data collection techniques and the development of the diagnostic data base are far more important to the success or failure of the system than the mathematical processing techniques that are used," he said.

Both open-ended and multiple-choice questions are used in the interview and the patient has the option of skipping any question. The manner in which the computer branches from question to question depends on how the patient responds to each question in succession.

After the interview, a summary of the information collected is provided in about two and one half minutes and the patient is predicted as being either a serious risk, nonserious risk, having thoughts of suicide or having no thoughts of suicide.

The interview in use at the university was developed in 1971 and about 200 patients have used it so far, Greist said.

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French Agency Spends Millions For Little DP Use

By Andrew Lloyd
Special to Computerworld

PARIS – The use of computers by public authorities has hit the headlines in France with the disclosure recently that the national health service spent almost $50 million on computers from 1971 to 1974 but computerized only 1.5% of its accounting procedures.

The body in question – the Caisse Nationale d'Assurance Maladie – did not deny the figures, but a spokesman said DP accounted for only .2% of its total expenditures.

The information on the health service's use of DP came from a formerly confidential report requested by the French Ministry of Finance and delivered to it in March.

The information was leaked to the press by the president of a French medical association whose members are facing highly exaggerated tax demands because of a faulty computer system.

The health service is a big user of equipment from both IBM and Compagnie Internationale pour l'Informatique (CII). CII is the French national company which is merging with Honeywell Bull.

By 1974, only 16 out of a scheduled 26 computers had been installed – eight CII Iris systems, five IBM 370/135s, two Philips P1175s and one Honeywell Bull 6025.

The spokesman for the health service complained the body had been under some pressure from the industry minister to buy from suppliers it would not otherwise have chosen.

He also complained that only the bad parts of the report had been leaked. But when asked what good points had emerged from the report, he was able only to stress the report had been "constructively critical."

Despite the implication of hardware difficulties by the health service, the medical association accused the authorities of proceeding with an ill-prepared task with an incompetent staff.

The author of the audit which revealed the facts was the software house CAP-Sogeti. Its chairman, Jean Renondin, declined to comment on the disclosures on the grounds of professional secrecy.

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Unique Features Shape Swedish DP State of the Art

By Julia Van Duyn
Special to Computerworld

STOCKHOLM, Sweden – To understand the data processing state of the art here, three uniquely Swedish features must be taken into consideration.

One is that each child at birth is assigned a unique "civic registration number" which consists of the YY/MM/DD plus a four-digit control field.

This number is on every Swede's birth certificate, school records, driver's license, library card and so on, up to and including the death certificate.

A person cannot have more than one civic registration number during his lifetime.

Another feature is that every DP center here – whether commercial or government – must apply to the Data Inspection Department (established two years ago, after the privacy law went into effect) for permission if it wants to set up a file/record on an individual.

Moreover, it has to state specifically what the data will be used for. This law protects the Swedish individual's privacy, i.e., it guarantees that data such as salary, credit rating, assets, matrimonial state, etc., does not become a commercial product that can be sold to anyone who can pay the price.

This regulation also ensures that there is no duplication of the same data of the same person in several DP centers within a given type of industry or interest area.

A third uniquely Swedish feature is that every systems analyst, programmer, computer operator, remote-job entry (RJE) operator, tape librarian, etc., belongs to some labor union, as does virtually every worker in Sweden, regardless of the type of work he does.

Challenge to Ingenuity

Working within these constrictions seems to challenge the ingenuity of Swedish DP professionals. Take the case of Skandia, the largest insurance company in Scandinavia, whose DP center is here in Stockholm.

One of its major systems is designed around the civic registration number of its customers. The system, called Stofi (the system's Swedish initials translated into English mean "controlled transaction and inquiry input" system), transmits a constant stream of inquiries and input via a network of 483 Stansaab CRT terminals located in regional offices all over Sweden.

By using the unique civic registration number of each Swede as an ID number, and Stofi's simple yet powerful command language, it is easy for a clerk in any of these offices to access and retrieve the required information about a customer's insurance.

An Example

For example, if a customer wants to change his insurance because he has traded his car, the clerk retrieves the customer's record by keying in "M" (for motor vehicle type of insurance), the person's civic registration number and lastly two digits for the policy number. The clerk then inputs the new data, verifies it on the screen and transmits it to the computer center in Stockholm.

The customer now receives confirmation of his insurance policy covering his newly acquired car, generally within 48 hours, instead of a week or two later, as in the past.

Thus, by eliminating a lot of paperwork, handled by many people – which invariably increases the possibility of errors – and by inputting data directly from the source documents to the computer after it has been verified, the system cost-justified itself.

Within the next couple of years Skandia plans to expand the capabilities of Stofi in order to let the regional offices process 80% to 90% of all claims on losses which occur outside the locale of the head office.

IBM Equipment Used

The hardware in Skandia's DP center is 99.5% IBM, including: two 370/158 multiplexer mainframes (OS, MVT/VS2), one with 2M bytes and the other with 1M bytes, 3420 tape drives; 3330 disk drives; 3803 tape control units; 3704 teleprocessing controllers; 3211 high-speed printers; 3270 teleprocessing printers and CRTs; and many more.

The only non-IBM hardware Skandia uses are two Memorex 3670 disk drives and the Stansaab CRT terminals.

If the 121 year-old insurance company's hardware is impressive, its software is perhaps even more so. At Skandia, as in most DP centers in Sweden, Cobol is used 75%, Assembly language approximately 22% and PL/1 and Fortran make up the balance of 3%.

Being an IBM shop, it uses Hasp as its spooler, IMS for data base, modified structured programming and time-sharing option (TSO) for on-line program development, interactive computing and problem solving. Skandia's utility programs are extensive and functional.

The Systems Service Department is divided into Administrative, Technical Support and Application Development units.

With a staff of 220 persons, they support industrial, marine and commercial systems; personal and nonlife systems; life and group life systems; customer and marketing systems; management support systems; and international systems.

The flexibility and progressiveness of Skandia's DP management can be seen in the "prodebating and problem-solving" climate it provides the staff.

For instance, Skandia recently initiated a new and exciting concept: all systems analysts and programmers act as consultants to all on-going projects. And while they interface with each other through all stages of the projects, they work independently.

Thus, each person's expertise is optimally utilized, because – as consultants – they are called in by the project leaders only when their knowledge and experience are needed at a particular stage of the project.

Moreover, if the particular type of staff needed for a certain project is busy at something else, the project leader is allowed to contract outside EDP consultants, i.e., systems analysts and/or programmers from various software service companies. At Skandia, this practice is looked upon as "quality assurance."

Van Duyn is a national lecturer for the Association for Computing Machinery (ACM) and author of Practical Systems and Procedures Manual.



ICCP, Psychological Corp. Sign Testing Pact

CHICAGO – The Institute for Certification of Computer Professionals (ICCP) has signed an agreement with The Psychological Corp. for assistance in its testing programs, particularly the Certificate in Data Processing (CDP) examination.

The Psychological Corp. will provide psychometric consultation and services and administrative support and will cooperate in the expansion of ICCP's programs to provide broader certification test coverage for personnel in the computing industry.

The CDP exam now consists of five sections and may be taken by any person with a minimum of 60 month's full-time or equivalent part-time work experience in a computer-based information system environment.

College-level academic experience may be submitted as partial fulfillment of the experience requirements, according to the institute.

Persons who do not meet the experience qualification may still sit for the exam; the CDP award will be made when evidence of completion of the experience qualification is submitted, ICCP noted.

To receive the certificate, every candidate must successfully complete all five sections of the exam.

The next exam, to be conducted under the agreement between ICCP and The Psychological Corp., will be given Feb. 21, 1976 at testing locations throughout the U.S. and Canada. Further information is available from ICCP at 304 E. 45th St., New York, N.Y. 10017.

McFarland Named To DPMA Position

PARK RIDGE, Ill. – The Data Processing Management Association (DPMA) has named T. David McFarland as its executive director.

McFarland joined the 23,000-member association as membership director in January 1973. Previously he had been assistant secretary for membership activities of the American Society of Agricultural Engineers.

Call for Papers

FOURTH ANNUAL SYMPOSIUM ON THE SIMULATION OF COMPUTER SYSTEMS, Aug. 10-12, Boulder, Colo.

Papers are being solicited on the simulation of computer systems as applied to all phases of computer utilization and procurement. Applicable subjects include systems design and modeling, program design and testing, selection, configuration and optimization. Presentations for tutorial and workshop sessions are also solicited.

Abstracts should be submitted by Dec. 15 to Dr. Gary J. Nutt, University of Colorado, Boulder, Colo. 80302.

1976 INTERNATIONAL OPTICAL COMPUTING CONFERENCE, April 27-29, Capri, Italy.

Suggested topics for the conference include optical computing systems realizations; optical pattern, character and object recognition (including robots); quasi-optical computing systems; and real-time and near-real-time light modulations.

A 250- to 300-word abstract or summary should be submitted by Dec. 15. Final papers are due by March 1. Abstracts should be sent to Sam Horvitz, Naval Underwater Systems Center, New London, Conn. 06320.

1976 NATIONAL COMPUTER CONFERENCE, June 7-10, New York.

Two-hundred authors are wanted for papers in every area of computer science, data handling, OP applications and information processing.

The total length must not exceed 5,000 words and must include an abstract of not over 200 words. Material such as equations, figures or reference listings should be counted as 300 words per manuscript page.

Six copies of the manuscript, typed and double-spaced, must be submitted by Jan. 5 to Dr. Stanley Winkler, IBM, 18100 Frederick Pike, Gaithersburg, Md. 20760.

SEVENTH ANNUAL CONFERENCE ON COMPUTERS IN THE UNDERGRADUATE CURRICULA, June 14-16, Binghamton, N.Y.

Papers are requested describing actual experience with computer use in undergraduate curriculum from a broad array of disciplines. Those received from minority institutions and small colleges will be given special consideration.

Because the conference emphasizes applications of computers in many disciplines, computer science is specifically excluded. Papers on computing services are considered only if they have novel features.

Papers should not exceed 15 pages and must be submitted by Jan. 15 to Gerald L. Engel, Virginia Institute of Marine Science, Gloucester Point, Va. 23062.

"TRENDS AND APPLICATIONS: MICRO AND MINI SYSTEMS," May 27, Gaithersburg, Md.

Submitted papers for the symposium should be of a tutorial nature, describing practical experiences with micro and mini systems or presenting new research results. Topics to be covered include: networks of processors, multiprocessor ensembles, intelligent terminals, novel architectures, programming and operating systems, security, performance evaluation and novel aplications.

Three copies of a 1,000-word abstract should be submitted to Jack Benoit, Mitre Corp., Westgate Research Park, McLean, Va. 22101 by Jan. 15.

14th ANNUAL ASSOCIATION FOR EDUCATIONAL DATA SYSTEMS (AEDS) CONVENTION, May 3-7, Phoenix.

Papers are requested in all areas related to computer use in instruction, educational administration or research.

An abstract of not more than 100 words should be submitted by Jan. 15 with final copies of the completed paper due by March 1. Generally, papers should not exceed 10 pages. All correspondence should be sent to Max Ivey, 1976 AEDS convention program chairperson, University Computing Services, Engineering B-Wing Room 101, Arizona State University, Tempe, Ariz. 85281.

Societies/ User Groups

ACM Adopts Resolution for Dissident Soviet Scientist

MINNEAPOLIS – The governing council of the Association for Computing Machinery (ACM) recently adopted a resolution expressing the hope that Dr. Valentin Turchin, a Russian computer scientist, will "be permitted to accept the invitation by Columbia University" to teach at that school.

Turchin, an ACM member, has reportedly been harassed by Soviet officials since 1973, when he became chairman of the Soviet group of Amnesty International and protested the treatment of dissidents in the Soviet Union [CW, Aug. 13].

Formerly head of a laboratory at the Institute for Automated Systems in the Building Industry, Turchin was dismissed in July 1973 and no one is permitted to hire him now.

Since April, Turchin's apartment has been searched and papers taken and he has been interrogated at length six times. He now feels there is no alternative but to leave the USSR, and was offered a post as Visiting Scholar in the Mathematics Department of Columbia. However, the Soviet government will not give him an exit visa.

ACM said it has had no word on Turchin's situation in a few months, although it has heard that the government "is closing in on him."

Societies/ User Groups

The resolution was adopted by the council during ACM's annual conference and copies have been sent to various Soviet scientific officials, as well as the chairman of the communist party, Leonid Brezhnev, and the Soviet ambassador to the U.S., Anatoly Dobrynin.

ACM has received no reaction from any of these people and the organization does not plan any further action on the matter, it said.

The full text of the resolution is as follows:

"The council is happy to note that Columbia University has invited Valentin Turchin, a computer scientist and Russian citizen now living in Russia, to accept a position as a Visiting Scholar in the Mathematics Department of the University.

"Prof. Turchin's visit would serve to advance the sciences and arts of information processing and promote the free interchange of information about the sciences and arts of information processing. Thereby, it would benefit the computing community and the public at large.

"His presence in the U.S. would make it possible for him to participate in meetings and conferences of the association, as well as other technical and scientific meetings and conferences.

"Therefore, the Council of the ACM expresses its hope that Dr. Turchin will be permitted to accept the invitation by Columbia University and voices its concern that he may be prevented from doing so."

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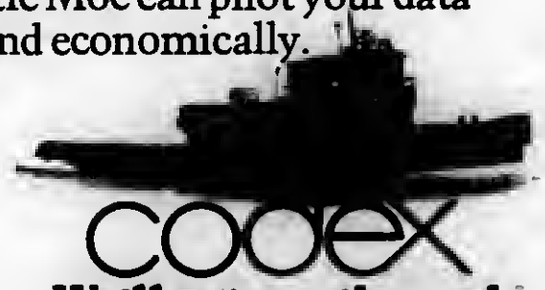
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Group Attacking Attitudes on DP

NO. HOLLYWOOD, Calif. – A judge who admitted he knows nothing about computers has helped establish the Southern California Computer Society (SCCS), an organization dedicated to changing the public attitude that the computer is a dehumanizing force.

Judge Pearce Young of the Los Angeles Superior Court started SCCS with Don Tarbell, a computer expert with the Hughes Corp., and Dr. G.A. Silver, a teacher and author of books on computer programming.

Governed by a 20-member board of directors, the society publishes a monthly newsletter and is actively engaged in developing a computer center.

Further information on the society is available from Silver at No. 405A, 12444 Victory Blvd., 91606.

Calendar

Jan. 11-14, New York – National Retail Merchants Association (NRMA) 65th Annual Convention and Business and Equipment Exposition. Contact: NRMA, 100 West 31st St., 10001.

Jan. 19-21, San Francisco – Meeting XIX of the Mark IV User Group, Inc. Contact: Mary K. Clyde, Program Chairman, IV League XIX, Chevron Research Co., Richmond, Calif. 94802.

Jan. 20-22, New York – '76 Input/Output Systems Seminar. Contact: Input/Output Systems Association, 999 Bedord St., Stamford, Conn. 06905.

Jan. 27-28, Valley Forge, Pa. – Second Workshop on Mass Storage Systems, sponsored by the IEEE Computer Society. Contact: Dr. David Freeman, Control Data Corp., 2621 Van Buren Road, Norristown, Pa. 19401.

Jan. 29-30, Paris – 3rd International Congress of Computers in Industry. Contact: Institut d'Informatique et de Gestion, 5 Rue Quention Bauchart, 75008.

Editorials

Volunteer to Help

The makeup of the National Commission on Electronic Funds Transfer has been sharply criticized by various industry observers, including our own Dr. Grosch [CW, Nov. 12] and the Association of Data Processing Service Organizations (Adapso) [CW, Nov. 19].

Certainly the commission should have been pulled together long before it was. "Inexcusable" is too kind a comment for the delay of nearly a year from the time President Gerald R. Ford signed the enabling legislation to the time he named the chairman and the industry and public members of the commission [CW, Oct. 15].

It is unfortunate, as has been noted by the critics, that there are no members on the commission itself with a great deal of technical computer-oriented background. Such an input at the commission level might well have been valuable.

However, it is likely that the commission members won't attempt to explore all the aspects of electronic funds transfer systems (EFTS) themselves. They should set up specific task groups to explore the many facets of the issue – social, financial and technical.

The commission's prime function should be to synthesize the work of these groups into a final overview report.

Certainly DP people – as well as experts from many other fields – should be called on to work in these more specialized task groups.

The commission has a national assignment and must explore many issues involving EFTS, not just the technical problems, which seems to argue in favor of having someone like Chairman William B. Widnall in charge of the group.

He is not just another "retired U.S. Congressman" for whom ex-Congressman Ford has found a job. He has a long history on the House Banking and Finance Committee and was ranking Republican member when he retired.

DP people should put aside their disappointment about their lack of representation on the commission and volunteer to help on the special task groups that will be established.

And we should all carefully watch the makeup of the subgroups in order to evaluate the job that can be expected of the commission.

'Mini' Needs Help

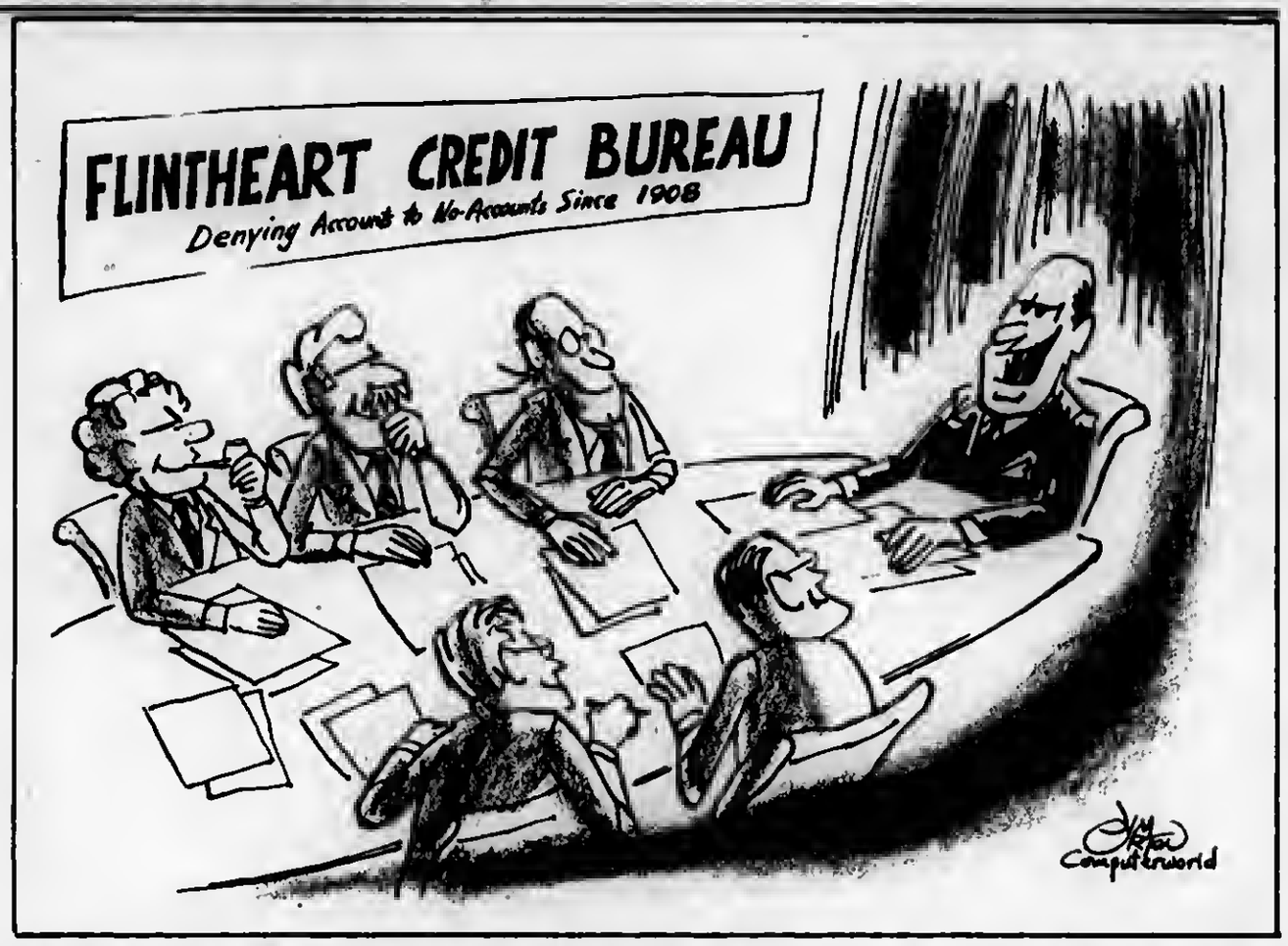
The idea of a specialized user organization devoted to minicomputers is a good one, and apparently many users feel the same way.

A major effort to start such a group, which has been incorporated as the Minicomputer Industry National Interchange (Mini) [CW, Sept. 17], has received over 3,000 responses from users seeking to join or requesting more information.

However, the response from the industry has been at best underwhelming. So far, no manufacturer has agreed to help partially underwrite the start-up costs for the organization, even though several have expressed some interest, according to Mini President Jon R. David at 256 Garabaldi Ave., Lodi, N.J. 07644.

The deadline for getting such support is just one week away, so action must be taken soon by those firms interested in the idea.

Hopefully the idea will not die, even if a lack of vendor response causes a reworking of the idea to make it a fully member-sponsored organization without any manufacturer funding.



'Resolved Then, Gentlemen: Rather Than Use the New Funds for Privacy Safeguards, They Go for Defending Privacy-Violation Lawsuits!'

Letters to the Editor

Seeing Record Displayed Beats Keypunch Check Digit Every Time

Hooray for Edwin Levy [CW, Nov. 26]!

How anyone can believe a check digit is better than seeing the name of the record being accessed displayed is beyond me.

We don't happen to sell Singer System Tens, but, if you ask our operators or our clients' operators how they would like a nice keypunch machine with no editing or self-checking, you could get laughed out of the country.

Would you believe we have programmers who think that record length is determined by the amount of data which needs to be stored and that 80 is a number between 79 and 81?

Cliff Fryda

Watertown, S.D.

Poor 'Quality and Substance'

The reader commentary on whether software should be classified as goods or services [CW, Nov. 19] was of poor "quality and substance" and "contributed nothing to the universe."

I'm sure *Computerworld* could have found something more maturely written to print on the subject. This reader didn't appreciate Gerald H. Larsen's analogy.

Joanne C. Lang

Rochester, N.Y.

Grosch Left Out of Commission

So, the lamentable Commissar Herb Grosch was left out of the electronic funds transfer system (EFTS) commission [CW, Nov. 12]. Naturally, he assumes he should have been chairman.

Imagine the commission having to listen to his political swill? It is bad enough that *Computerworld* gives him a forum.

H.J. Schuster

Los Angeles, Calif.

Wrong Course of Action

According to Jack M. Wolfe, women don't "want" promotions [CW, Oct. 15]. The semantic differentiation of this term may be the basis for one of the arguments which are put forth regarding discrimination against women – in DP or otherwise.

Women may very well not aggressively apply for or otherwise seek out promotion because they simply don't believe they have a chance.

They have watched their more aggressive counterparts get shot down in the attempt.

If "want" means they won't fight and gruel as they would be required to – i.e., prove that they are really men in women's bodies – then I would agree that they don't "want" promotions.

If, however, "want" means be willing (and able) to accept the challenges and responsibilities of such positions, Wolfe is mistaken.

It is a mistaken management notion that one must be "aggressive," willing to step on anyone in order to be in a responsible position.

Kate Oliver

Worcester, Mass.

Mistaken Management Notion

After reading Ed Tunstall's complaints regarding his NCR 200 [CW, Oct. 15], I feel I can no longer keep silent.

As far as I am concerned, his first course of action is to work things out with the local NCR service representatives regarding his maintenance (or lack thereof).

Turnstall's second course of action is to review his problems to ascertain if it is equipment or personnel causing the head crashes.

If equipment, he should go after the manufacturer properly, not through an open forum in *Computerworld*; if people, he should train them properly in usage of the system and, most definitely, in care of the equipment.

William S. Henderson

Lake Forest, Ill.

NCR Delivers Reliable Product

Not only has NCR really entered the computer field, it delivers a product that exhibits reliability day in and day out.

As a Century computer user for four years, we at The Drake Hotel have never had printers go up in smoke as Ed Tunstall stated has happened at his site.

We find that the system as a whole has low down-time, and, when peripheral errors do occur, the operating software's error diagnostic and correction routines perform admirably.

Our present mainframe is a Century 200. Since its installation two years ago, we have never experienced a head crash and, whenever a service call is necessary, the NCR customer engineers have the system back up in short order.

The software in general is easy to use and effective. The operating system offers features not often found in machines this size.

Application software is oriented to user function, increasing NCR's response and understanding of user problems.

Both the DP department and top management agree that our Century 200 has more than paid for itself in improved cash flow and cost-effective information gathering services.

James Troester

Chicago, Ill.

A Rather Small Indian

Singer was never on my list of vanishing IBM competitors, and not just because I had very good friends working there. It simply never got into the central-architecture category. Neither was Nixdorf, now it has dumped its Telefunken burden. NCR, some of the letters in CW to the contrary notwithstanding, is moving away, and DEC – perilously, as I say repeatedly – is moving toward central status.

But Singer never really tried. But it was and is a major factor in the point-of-sale market. Even though it is not one of my "ten little, nine little, eight little Indians," the recent removal of Don Kircher interested me. The announcement of Joe Flavin as his replacement showed quite clearly how little the conventional Wall-Street-Journal decision maker understands the computer racket.

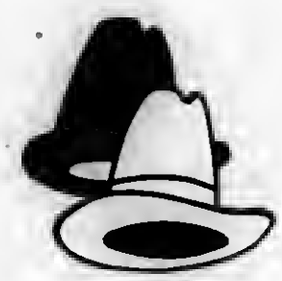
Flavin, whom I remember faintly as being in IBM World Trade during my second hitch, is and always has been a finance guy. But Singer's difficulties are not financial. Sure, like any other company, its troubles are *measured* in monetary terms. But its problems were in poor domestic sales and in performing to promises. What good can a controller type do in those areas?

I don't know what executive search outfit, if any, helped bring in a bean-counter to replace Kircher. Obviously they haven't thought through the basics of IBM dominance. Accounting practices and financial planning, superb though they are at Galactic Headquarters, are secondary or even tertiary skills. The key, as every customer knows, is salesmanship. Whatever the Gray Giant decides to push, whether in unlikely areas like dictating machines, blood dialysis equipment or PL/1, or in its mainstream markets, it pushes successfully – by selling! Once in a while there are stumbles, quickly glossed over, but in general IBM can sell anything: even VS, for heaven's sake!

Remodeling Singer management in a sales-oriented mode would not automatically insure success, or even good recovery. Look at XDS and the last years of RCA. As Bill Norris once said of something else (but closely related: complete absorption in the computer trade – that was prior to his buying Commercial Credit), it is a necessary but not a sufficient condition.

Singer can still give NCR and IBM (and Japanese and German and Italian competitors) a good run. It had early successes; the equipment lacked some human-interface consideration, and central software was *ngggh*, but the competition wasn't much better. What Singer needed, especially domestically and especially in the U.S. and worldwide depression, was creative salesmanship. It could have unloaded its unsalable computers on the humbler business ad schools, given huge discounts in Brazil, set up a customer training center in Las Vegas, advertised in *Penthouse* (sorry, Pat!). Instead – they worry about counting the money. *What* money???

I suppose Singer will dump data systems and go back to sewing machines. It would be a pity, for us in the trade, for international business for stockholders certainly, and for retail consumers, who need nicer point-of-sale gear. But there is a special infants' corner of the Indian burial ground that awaits IBM competitors who don't understand how to sell.



Herb Grosch

Still Time to Apply

The CDP Examination: What It Is, How to Prepare

The Certificate in Data Processing (CDP) examination is, for the first time, open to anyone whether or not they yet have satisfied that five-year experience requirement.

A change in the regulations now allows people to sit for the examination and pass the various sections necessary while they are still qualifying to actually be awarded the right to the initials.

The Taylor Report
By
Alan Taylor, CDP



However, I think any employer, seeing the results of an examination, will be able to give full value to such successes, so passing it is worthwhile, even without the three letters.

Perhaps this is what has doubled the number of inquiries this year. Whatever the reason, the examination, which is to be held Feb. 21 at 100 sites across the country, seems to be becoming stronger and stronger.

General Description

So, in case you are interested or know someone who is interested, here is a general description of the exam.

The exam is given on a Saturday. There are five sections: on equipment, programming, management, systems analysis and a hodgepodge of maths and accounting called "quantitative methods." You can take and pass sections separately; you don't have to pass or even take them together.

It costs $25 to become a candidate, another $10 to sit in a particular year, plus $10 for each section in which you sit. So you can get away with $45 the first year, (assuming you only sat for programming, for instance) and as little as $20 the next year, if you then want to take systems analysis only.

The questions are multiple-choice-type, such as "In Cobol, what type of condition is exhibited by the expression 'A AND B OR D OR E'" with the candidate having to choose from Or, Complex, Compound or Exclusive or This comes from the programming area.

A system question might be a simple one such as:

"What would the correct digit (X) be, using the sum-of-the-digits method, for the identification code 85463X?" Here the choices might be 2, 5, 6 and 16 with the correct answer being 6. (The Cobol expression was "compound," incidentally.)

Some, however are more judgment-oriented, as, for instance, another from the systems analysis area: "Which of the following is the least desirable purpose for conducting a postinstallation systems audit?

(1) To isolate remaining problems.
(2) To finalize system's documentation.
(3) To identify the actual improvements made by the system.
(4) To determine whether the system is performing according to specifications."

Problem Questions

Now, I happen to believe that a post-installation systems audit is a very desirable part of any system documentation. And I believe it is desirable that it precede the use of an installed system. As such, I find the fourth alternative obnoxious, as it assumes that some idiot has allowed a system to go into use before it is audited.

So my choice would be that No. 4 is the least desirable aim, because that permits live use of unaudited systems.

However, the group of five CDP holders who form the certification council disagree. They say No. 2 – completing documentation – is the correct answer.

This raises the problem of how one can prepare for the examination when there are a number of questions currently included in the question pool which have problems.

The CDP exam does have a study guide which is where the sample quoted above comes from.

This lists some .10 equipment texts, eight programming texts, 27 for management, 19 for accounting and maths and 15 for systems analysis.

The guide also has about a page on each section, with descriptive paragraphs followed by a "depth-of-knowledge" statement.

A typical one is the first in the systems analysis area. This is entitled "Defining the Systems Responsibility (A) Functions (B) Concepts (C) Planning (D) Team Organization (E) Control." This has a knowledge statement that reads: "Understand the functional responsibilities and organization of the systems group" – a description which wouldn't help me at all, for instance, in defining systems responsibility for (B) Concepts or (C) planning!

Assistance Program

The Society of Certified Data Processors (SCDP) provides the only organized and centrally located candidate-assistance program in the industry. This program is a three-step process:

- Thirty-question diagnostic examinations in each section. These are used to provide explanations of the reasoning behind any wrong answers you give to the diagnostic questions.
- Individual tutoring and reading assignments.
- A dry run through a 500-question examination, leading to final study suggestions.

Program Cost

The cost of the entire SCDP program is $50, although parts of the program can be obtained at a lower cost. Tutorial help from the 500-question examination is also available at $10 per section if needed.

The SCDP estimates that, as a review activity, the process can be completed in two to three months, which means it is still practical to start preparing for the 1976 examination now and certainly for those parts for which you feel you have already covered most of the ground.

So, there is the situation. The CDP exam seems to be taking hold, it is open to anybody, and there are study guides and an assistance program. Think it over – and I seriously suggest you plan to take it soon. The sooner the better.

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In a Nutshell

Fees

For examination: $45 to $85.
For assistance program: $15 to $50.

Examination Date

Feb. 21 (Special arrangements made for religous conflicts).

Examination Form

Five 50-minute sections, each section containing 60 multiple-choice questions.

Examination Qualifications

Character reference from a CDP or immediate supervisor.

CDP Award Qualifications

Passing all sections in one or more examinations, 60 months experience with a possible reduction for academic courses.

Addresses

For study guides and registration forms, write to the Institute for Certification of Computer Professionals (ICCP), 304 East 45th St., New York, N.Y. 10017 or SCDP, 500 12th St., Washington, D.C. 20024 or telephone SCDP at (202) 554-4632.

For candiate assistance program details, write or telephone SCDP.

There are many performance evaluation tools... How do you decide which to use first?

It doesn't require a lot of money or complicated techniques to get started. The table at the right provides a good common sense approach.

Look at the bottom two rows. It is easy to see why over 400 computer installations are already using the Johnson Job Accounting Report System as the cornerstone of their performance evaluation programs. If you are a cost conscious manager, who must get the largest improvement for the minimum expenditure of dollars, job accounting has to be your first choice.

PERFORMANCE EVALUATION TOOL SELECTION GUIDE

If you have this system	Use These Tools				
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370/125	✓				
370/135	✓	✓			
370/145	✓	✓	✓		
370/158	✓	✓	✓	✓	
370/168	✓	✓	✓	✓	✓
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2975

ACM Special Issue Scope Defective Without Warnier

By Peter M. Neely
Special to Computerworld

In the Nov. 5 issue of *Computerworld*, "Structured Program Guidelines Found In ACM Effort" by Daniel Couger appeared. Couger considered the Association for Computing Machinery's special issue to be outstanding.

Unfortunately, I consider it significantly defective in scope of coverage. In particular there is no mention of Jean-Dominique Warnier nor of his programming system, Lois de Construction des Programmes (LCP).

It is my belief that academicians who profess to be computer scientists have also an obligation to be scholars. A scholar should be aware not just of the work of immediate colleagues, but also of work in related fields and in other countries.

I first noted a reference to LCP in Sept. 6, 1972 issue of CW. Since LCP, or the Warnier methodology, has enjoyed wide usage in France and other European countries and a series of textbooks is devoted to its exposition, a scholar presumably should be aware of its existence.

It is my contention LCP and top-down structured programming are essentially equivalent, even though stylistic elements may tend to obscure this. But, and this is most important, the derivation of LCP is much more rigorously developed than is that of structured programming.

Suppose there are two sets of data. The first is the set of required output, the second is the set of input required in the computation of the output. The input will be ignored here.

Consider the set of all output as the whole set. Decompose this into subsets which can be considered as single entities at the next level of abstraction. Repeat as needed until the individual data elements are reached.

The three basic constructs of structured programming are then derived as follows:

- Succession – to impose order on the unordered sets (subsets).
- Selection – to select a subset or its complement (relative complement).
- Repetition – to process all elements of a set (subset).

Furthermore, correctness of design (decomposition) in the event of complicated decomposition can be confirmed by use of the Boolean algebra induced by a set and its subsets.

Reader Commentary

If one reads Warnier's work one will find efficiency as well as correctness is addressed. Examples are given showing differences of efficiency of logically equivalent decompositions. The logical equivalence of alternative decompositions is easy to show by set membership since there is no dependence whatsoever on proving equivalence of programming linguistic constructs.

A partial bibliography is:

Warnier, J.D., and B.M. Flanagan, *Entrainement a la Programmation, Tome 1: Construction des Programmes*. Pariz: Les Editions d'Organization, 1972.

Warnier, J.D. *Entrainement a la Programmation, Tome 2: Exploitation des Donnees*. Paris: Les Editions d'Organization, 1972.

Warnier, J.D., *L'Organization des Donnees d'un Systeme*. Paris: Les Editions d'Organization, 1974.

Warnier, J.D., *La Transformation des Programmes*. Paris: Les Editions d'Organization, 1975.

And, finally, in English:

Warnier, J.D., *Logical Construction of Programs*. Leiden Holland: H.E. Stenfert Kroese, 1974.

Neely is with the University of Kansas' Computation Center.

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SOFTWARE&SERVICES

RSTS/E Users Gain Fortran IV, Cobol

MAYNARD, Mass. – In a series of quiet moves starting in August, Digital Equipment Corp. has extended both the multiuser capabilities of RSTS/E on the PDP-11 and the language processors available to the users of the operating system.

The lastest extension, announeed at sales meetings in October with deliveries scheduled for January, is support for Fortran IV, including a facility for CALLing macro-level assembly code to resolve logic problems that can't be handled in Fortran.

By acquiring this language processor, users should be able to immediately utilize any of the hundreds of Fortran IV routines, programs and whole libraries of routines that have been developed over many years for full-scale mainframes, DEC said, claiming its Fortran is industry-compatible.

Cobol Added

Earlier this year, in its announcement of RSTS/E Release 6A in August, DEC added Cobol, another language which should allow immediate use of many commercially available packages on the PDP-11. Unlike the Fortran IV processor, which can be used with as little as 16K memory, Cobol requires 64K storage, a DEC spokesman said.

The RSTS/E Cobol is compatible with the 1974 American National Standards Institute (Ansi) specifications and includes high-level implementations of the Nucleus and Table Handling, Sequential I/O and Relative I/O modules, the spokesman added.

Low-level implementations of the Segmentation and Library modules can be combined with capabilities that are already part of RSTS/E. And independent sort/merge and report generator utilities take the place of the ANS modules related to those functions, he said.

Compiler Under Test

The compiler itself has been submitted to the Federal Cobol Compiler Testing Service, another source at DEC indicated, but results of the submission were not immediately available.

The multiple-user capability of RSTS/E was extended in the 6A release so that for the PDP-11/70, at least, 63 users can now be accommodated concurrently. For smaller PDP-11s, the maximum was boosted to 32 users, DEC noted.

The Cobol compiler with the supporting utilities is available now for $7,000. The Fortran IV – essentially the same compiler previously available under RT-11 – will cost $1,500 when it is delivered early in 1976.

'Sara's' CRU Eases Bank's Use of SMF

By Don Leavitt
Of the CW Staff

DENVER – Many large-scale IBM 360 and 370 installations become overwhelmed by the amount of data they get from System Management Facilities (SMF) records collected under OS.

But the Colorado National Bank here has found a package that pulls a lot of SMF numbers into a single figure for each job, and that "works pretty well," according to systems programmer Larry Klein.

Performance Evaluation

The bank has only recently completed a two-year-long conversion from DOS and, until that was over, it had little need to measure and perhaps tune its operations, Klein said.

Early last April, however the bank acquired the Systems Analysis Resource Accounting (Sara) package from Boeing Computer Services (BCS).

As Its name implies, Sara is basically an accounting system "but It has some items that can be used for performance monitoring, in a small way," the programmer explained.

The thing that sets Sara apart from most other packages – for accounting or monitoring – is its generation of a single, repeatable number called a Computer Resource Unit (CRU) as the end result of an equation that attempts, at least, to take into account all the resources used by each job.

Factors included in the equation are CPU time, channel time, transfer rates for different devices and core size. Weights applied to these factors, and indeed the factors themselves, can be redefined by the user until they reflect – in the installation's view – the true relative cost of each job.

Once the CRU has been defined, the bank is then able to define its workload and how the patterns of job mix, deadlines and resource usage work in its shop. Each job is run and its CRU is noted.

"Then you decide where you want to make adjustments and see what the changes do to this relative picture of the job's use of the effective power of the system," Klein said, "Does [the change] improve the CRU? Where do you go from here? That's what we've been doing with it."

Cautious About Modifieations

Although the bank has the ability to modify the equation that generates what it considers to be its CRU, Klein said he had pretty much gone with the default values provided by BCS. He is cautious about making any radlcal changes in that basic calculation, he said, since all of the "readings" per job are relative to the equation; if the base is changed, all the figures accumulated to data are irrelevant.

The bank has a 1M 370/145 and a 1M 155 which share 18 IBM 3330 disk drives and 10 Storage Technology Corp. 3480 tape units. The 145 is used for on-line work, runs under OS/VS1 and is not being monitored by Sara.

SMF data is keyed to the start and stop times of individual jobs, Klein noted, and with on-line operations, one job is in operation all day long.

The 155, on the other hand, handles batch work for checking accounts, loan accounting and savings for more than 10 banks in addition to Colorado National.

It is hard to put a finger on any direct improvement triggered by Sara, Klein admitted, but it has helped in several little ways.

The nature of bank work prevents anything less than 24-hour operations, he explained, but he "did look at certain jobs as far as core usage was concerned and did cut them down to point where we alleviated some problems at certain points of the day."

A reordering of SVC lists was triggered by the bank's use of the Slacmon or Supermon software monitor from Cosmic, but Klein noted it was in the daily reports out of Sara that the value of the reordering was confirmed.

The bank considered several alternatives before choosing Sara, but rejected some of the more comprehensive software monitoring packages because of their cost. They were just too expensive for its situation, Klein said, noting the bank does not yet feel it can afford people full-time on system performance.

In addition to Slacmon or Supermon, the bank uses a package from Value Computing to manage chargebacks to using departments, and IBM's General Trace Facility is brought out "every once in a while" to check out a particular programming problem.

Univac Courts Honeywell Users With Conversion Aid for 90/30

BLUE BELL, Pa. – Source programs and data files previously used on Honeywell 200 and 2000 series CPUs can be moved to the low end of Univac's Series 90 – the 90/30 – with a conversion package now available from Univac.

The conversion work can be carried out on a user's own 90/30, if it has already been delivered, or at a Univac customer service center, the vendor noted.

The center's facilities may also be used by 90/30 users whose systems do not include magnetic tape, which the conversion package requires, a spokesman added.

Three specific conversion aids are included in the package. CTC 3 is a translator to convert Honeywell 200/2000 series Cobol source programs to Univac 90/30 Cobol.

ETC 3 goes even further, aiding those Honeywell users who have not developed their source programs in Cobol. This translator package converts Honeywell's 200/2000 series Easycoder source programs to Univac 90/30 Cobol, the Univac spokesman noted.

Finally, the conversion package includes Ficon, which Univac described as a data base conversion program to create magnetic tape or disk files in Univac format from existing Honeywell-formatted files.

The 90/30 system's Report Program Generator is an industry-standard implementation which can accept existing programs with minor modifications, the Univac source added.

In operation, the conversion process takes three steps, he said: making an inventory of all programs and data files; translating them; and testing them to ensure proper operation in the new environment.

Once conversion has been completed, user programs and application systems will operate under control of OS/3, the standard Univac-supplied operating system for the 90/30. They become a part of the user's library, indistinguishable from any programs the user writes directly in the "native" 90/30 languages, Univac said.

Standards Group Impasse at End

WASHINGTON, D.C. – The Standards Planning Requirement Committee (Sparc) has apparently resolved the impasse which was facing its data base management system task group [CW, Nov. 19].

The problem of the data manipulation language specifications has been taken off the task group's agenda and given, instead, to American National Standards Institute committee on Cobol, X3J4, since the interface environment currently being considered is from that high-level language, according to Sparc Chairman William Madison of Harvard Business School.

Relieved of that problem area, the task group has been asked to return to its basic work of determing the feasibility of a standardization effort for data base management systems.

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'Infosys' Application Packages Tailored for S/32 Installations

ANN ARBOR, Mich. – Manufacturers and distributors can pick and choose individual application systems from Apodictics, Inc. to put together as extended an operation as they want on an IBM System/32 CPU.

The so-called Infosys packages are said to handle all business functions including order entry and invoicing, sales analysis, cost control and accounting.

Inventory control, payroll and purchase order control are also supported by the Apodictics software, a spokesman said.

Work-in-process, bill-of-materials and material requirements control are still other areas covered by the Infosys packages, he added.

The applications are designed to use the CRT screen on the System/32 as a prompting device. Coupled with editing functions applied as soon as data is entered, this assures that only correct data is entered, he claimed.

Each application system provides a paper audit trail which can be used to reconcile its operations at the end of any accounting period, he added.

Each subsystem is designed to accommodate a wide range of business requirements, according to the vendor. These include pricing based on total quantity of order, automatic back orders, open item receivables, multiple corporations, user-defined charts of accounts and automatic commission calculations, the spokesman explained.

The packages are available for one-time fees covering five years or for monthly rental fees plus installation charges. The one-time fees range from $1,500 for order entry to $650 for accounts payable; monthly rates are from $48 to $20 after installation charges of $500 to $250.

Prices include some customizing. The vendor also provides file conversion support for $100 per application system.

Apodictics can be reached through P.O. Box 2109, 48109.

Interactive Goes Overseas

WALTHAM, Mass. – Interactive Data Corp. now has a branch office in London providing on-line access to the company's financial and investment-oriented data bases, a spokesman said from 486 Totten Pond Road, 02154.

N.Y. OS Users to Look at CPE

NEW YORK – The next two meetings of the OS Eastern Region Systems Group (Oserg), one scheduled for next week and the second in mid-January, will be devoted to computer performance evaluation (CPE) topics.

The sessions are open to interested users not already members, according to the group's secretary.

On Dec. 19, the group will hear users tell of their experiences with hardware and software monitors on IBM systems at several large New York installations, she said. On Jan. 23, a technical presentation on performance monitoring will be made by a vendor spokesman.

Oserg is made up of systems programming management and technical representatives from more than 100 installations utilizing IBM's OS and OS/VS in the New York metropolitan area.

Described as a supplement to Share and Guide on the local level, Oserg meets monthly in Manhattan to provide a forum to air – and hopefully resolve – software-related problems, to hear special presentations by members and vendors and to coordinate activities with other user groups.

Specific information about the CPE-oriented meetings or about membership requirements is available from Marvin L. Silverman, Oserg president, 75-23 113th St., Forest Hills, N.Y. 11375.

IPL Links Transactions to Data Bases

ANN ARBOR, Mich. – The Cyphernetics Division of Automatic Data Processing, Inc. has added the Information Processing Language (IPL) to its network's capabilities.

Described as a high-level language emphasizing "ease of use and flexibility" in data base management and transaction-processing applications, IPL was designed for the cost-effective development of systems to collect, organize, validate, update, report and control management information, Cyphernetics said.

Through a combination of features, IPL is said to provide the benefits of flexibility in the design of systems while retaining efficient processing.

IPL offers a variety of techniques for the storage, retrieval and analysis of large quantities of information. Data can be structured to meet special requirements and to permit multiple applications of a data base with one-time input.

IPL's validation techniques filter data at the source to ensure accuracy. Data bases can be updated at will with low cost, while IPL's built-in security controls limit access to sensitive information, a spokesman said.

Should requirements change or new information be required, the entire data base may be reorganized through a single "transform command," he added.

A reporting system facilitates the creation of both production and ad hoc reports in any format desired. Unlike most data base management and transaction processing systems, IPL systems may be integrated into existing applications that use standard languages or other Cyphernetics information management products, network sources noted.

IPL may be used with any standard remote computing terminal and is "ideal" for applications requiring data entry and reporting from multiple locations, Cyphernetics claimed.

The ease with which modifications may be made to both data bases and reports makes IPL "particularly attractive in fast-changing environments" where conventional data base systems and standard languages such as Fortran, Cobol or Basic are impractical, the spokesman continued.

Cyphernetics is headquartered at 175 Jackson Plaza, 48106.

Asgol Puts 'PL/1' Code on Nova

ORANGE, Calif. – With high-level constructs described as similar to Algol or PL/1, Asgol from MDB Systems, Inc. is said to be a structured programming language operating under RDOS or XDOS on Data General Nova or "Nova-transparent" minicomputer systems.

Providing "intellectual manageability," the language processor features a "flexible and generalized expression organization," a stylized listing to replace the flow chart embedded Assembly language, typeless variables and code efficiency, the vendor explained.

The compiler indents at each BEGIN and END level and provides visual linkage and numbering of corresponding BEGIN-END pairs. This visibility does not eliminate the need for competent systems programmers, MDB admitted, "but it does make such individuals 50% more productive."

Recursive and reentrant object code is generated by the compiler. Reentrant code has many advantages, according to MDB, including fast context switching in systems.

Recursive techniques are important, the vendor continued, in the development of compilers and interpretive language processors.

The compiler operates in a single pass, is written in Asgol and is composed of many "external procedures" which are called into core as needed. It will run in as little as 8K of memory, but runs faster with more, the vendor said.

A programmer's manual, which could serve as an introduction to the language, is available for $10. The Asgol software itself costs $1,250.

MDB Systems is at 981 N. Main St., 92667.

IFM Called File Manager, DBMS

KANSAS CITY, Mo. – Now available on the United Computing Systems (UCS) network, the Interactive File Manager (IFM) functions as both a file manager and a data base management system (DBMS).

While IFM can perform routine file maintenance requirements, it is also capable of handling applications such as inventory control, personnel management and sales and accounting information systems, according to UCS.

IFM has a vocabulary of 13 action verbs (HELP, SORT, UPDATE, SCAN and PRINT, for example). Keyword phrases direct these verbs to the specific data upon which action is to be taken.

The Macro verb, which allows definition of new IFM verbs, extends the potential of the program for the experienced user. A prompting capability within IFM helps direct the novice user.

Report creation is facilitated through the PRINT verb for simple ad hoc work and the REPORT verb for standard, repetitious output.

IFM's file maintenance and management capabilities are available in the interactive mode. They eliminate the need for complex batch systems such as Sort/Merge and specially developed Fortran or Cobol programs, UCS claimed.

The combination of the file management and data base management capabilities permits development of information systems around a multiple file environment.

The output file containing sales forecasts from a forecasting program, for example, can form part of a sales management system, eliminating the need for reformatting or loading into a separate data base, UCS said.

IFM is accessible in time-sharing and remote job entry modes from the over 90 cities across the nation currently serviced by UCS's Uninet communications system. IFM is also available nationally via In-Wats communications facilities in the remote batch mode.

UCS is based at 2525 Washington, 64108.

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Notes and observations from IBM which may prove of interest to data processing professionals.



An ETMF freight depot near Chicago at dusk.
IBM 3767 terminals are linked by a communications network spread through 19 states.

Freight Carrier Picks Up Speed with New Communications Terminal

It isn't every day a company installs new terminals throughout its operation, enlarges the scope of its communications system and projects a savings of some $60,000 a year.

That's what's happening at ETMF Freight System of Dallas, where new IBM 3767 Communication Terminals have replaced the company's 2740s in 55 freight terminals around the country.

"Not only do the new hardcopy 3767s cost 24% less than the 2740s," says Tom Hendrickson, director of management systems, "but they can also print up to five times faster."

The 3767s are the latest addition to ETMF's on-line network, which uses the IBM Freight and Equipment Reporting System for Transportation (FERST/VS) for message switching and equipment control. At ETMF, the FERST/VS group of Program Products runs on a System/370 Model 145 linked to a communications network that connects the carrier's freight terminals.

This fall, the company expects to install the third program of the FERST/VS package—billing. "Putting the billing function online would have meant adding terminals to handle the extra workload," says Hendrickson. "But the greater speed of the 3767s means we will need fewer additional terminals to do the job. We figure the saving on machine replacement, plus the saving on additional machines, will add up to some $60,000 a year."

The 3767 prints faster because it is a bidirectional matrix printer. Its built-in logic microcode determines whether it would be faster to print from left to right or right to left. It can also decide how best to move on to the next print position, say an indentation or a tabbed column, without any wasted motion. The result: the 3767 can print up to 80 characters per second.

"An inventory report can now be printed in ten minutes," Hendrickson says. "With the 2740, this job would have taken almost half an hour."

He points out that the faster printing speed means the machine is more available to receive reports and enter data. And getting more information more quickly means that ETMF is in a better position to assure on-time pickup and delivery. "Timely service is the most important product a freight line has to sell, especially since all rates are regulated by the Interstate Commerce Commission."

Were the 3767s easy to install? According to Hendrickson, it was a "plug-in" situation for the most part. "We needed little help from IBM, and we were able to schedule installation when it was convenient for ETMF." He goes so far as to say he can install a 3767 himself in 15 minutes flat. "Operators adapted quickly to the new terminals, and no training people had to be sent out to the field."

The new machines have proved highly reliable. Based on Large Scale Integration (LSI) technology, they have few mechanical parts to go wrong. Should any trouble occur, a built-in diagnostic capability alerts the operator and the problem can be isolated. Often this can be remedied on the spot . . . an important consideration in a small, remote freight terminal.

The new terminals have improved the productivity of the communications system at ETMF. They have also opened the way to growth, because they are compatible with Systems Network Architecture (SNA). "This combination of equipment and programs will simplify the connections among controllers, lines and terminals in our system," says Hendrickson. In 1976, plans call for the installation of three components of SNA: Synchronous Data Link Control (SDLC), Virtual Telecommunications Access Method (VTAM) and Network Control Program (NCP).

"With these enhancements," continues Hendrickson, "we will be able to increase transmission speed while continuing to give our users at remote terminals direct access to application programs in our central computer. In addition, we will be able to use many different kinds of terminals with varying functions within the network."

Computer Helps Farmers Fight the Blight

Figuring out the best time to spray potato crops to prevent blight used to be largely a matter of guesswork. But for the past four years, more than 100 farmers from Maine to Florida have been getting valuable assistance in their battle against a lethal, blight-producing fungus from an unexpected source—a computer program known as "Blitecast".

Developed and administered by plant pathologists at Pennsylvania State University at University Park, Pa., the Blitecast program predicts the appearance of the fungus seven to fourteen days in advance. Data for the program is collected with hygrothermographs and rain gauges, which monitor temperature, humidity and rainfall in each field on a daily basis. At the end of the week, growers telephone the data to researcher John Peplinski, who uses a typewriter terminal in his office to enter the information into the university's System/370 Model 168. The data is analyzed against the conditions that are known to promote fungus growth—warm days, cool nights and extended periods of humidity exceeding 90%.

Within a few seconds, the computer prints out a recommendation indicating whether it will be necessary for the farmer to spray fungicide that week. "It used to be standard procedure to spray automatically once a week," says Peplinski. "By using our program, many growers have cut their spraying schedules substantially, without sacrificing crop safety. At $4 per acre for fungicide, farmers can save considerable money—and cut pollution at the same time—if conditions don't indicate fungus growth."

The computer can also produce a longer report that summarizes blight forecasts, weather conditions and spray recommendations made to date for each participant. A typical file extends for the duration of the potato growing season — generally from May through August.

In research related to the Blitecast program, scientists at Penn State are also studying the extent to which reduced concentrations of fungicide will effectively kill blight, and the precise relationship between weather conditions and tuber maturity. "Our goal is to increase crop yield by every possible means," says Peplinski. "Using the computer is the only way we can get accurate predictions to our farmers quickly enough to be effective."



At the Penn State University test plot in Rock Springs, Pa., plant pathologists study conditions that cause potato blight.

Advertisement

"One of the sweetest systems in the industry"

That's the way Mario Calderin sums up his experience with the new IBM 3790 Communication System. Calderin is director of management information systems at Work Wear Corporation's Rental Services Division. The Encino, California, company installed one of the first 3790 networks in the country. Running under IBM's Systems Network Architecture (SNA), the 3790 brings new data processing capabilities to the company's remote locations. At the same time, it streamlines the flow of information between the field and the System/370 Model 145 at the firm's central computer facility. Calderin was so enthusiastic over his early success with the 3790 that we asked him to tell the story in his own words.



Mario Calderin

What has the 3790 accomplished for your company?

"There are two major benefits that the 3790 is bringing to Work Wear . . . centralized financial control . . . and decentralized operational control.

"With the 3790 system, we're giving data—and the responsibility for handling it—to our sales regions. And corporate is getting a complete picture of the financial state of the company in real time . . . which means in time to act on it."

Why do you say those are major benefits?

"Because of the nature of our business. We rent and launder work clothes and industrial and linen supply items at 33 remote locations across the country. That's problem number one—geographical dispersion. And every day we've got to account for four or five million pieces of laundry that are somewhere in the process of being picked up, cleaned or delivered to our customers. That's problem number two—a fantastic amount of detail work to keep track of daily."

How did you handle all that before?

"Badly. Three years ago, I would have said that our major product was paperwork. Paper reflecting over a million transactions a month flowed from the plants to four regional data centers, where it was keypunched and entered in local computers. These in turn transmitted the data to the central computer at our Los Angeles headquarters.

"By the time everything was logged in and errors reconciled, the information was out of date. It was history. Moreover, it was indigestible. Different standards used in different regions resulted in data incompatibility."

What changes have you made?

"When the 3790 system is completely installed—most of it is already in place—data from all 33 locations will be transmitted at the close of each business day to our Model 145 in Los Angeles. By the start of the next morning, management can know exactly where we stand, company-wide, on order volume, bank deposits, accounts receivable, inventory status, and other vital information. That's what makes centralized financial control possible."

How is the data entered in field locations?

"Each plant has two or three 3277 Display Stations linked to its own 3791 controller—a programmed unit that cuts down the burden on our central computer. As each item is entered at the terminal, it's checked for validity, with corrections being made on the spot. It then goes to the controller, where the plant data files are updated. At night, the controller transmits the day's data to the 145, which updates the company-wide master files.

"The 145 then prints out documents like the day's invoices and drivers' pickup slips—between 40,000 and 50,000 of each daily, or some two million a month—for distribution by courier back to the plants. But starting in the summer, all this plant work will be offloaded through the 3790—a tremendous step forward."

What do you mean by "offloaded"?

"There'll be a line printer at each plant. The 3790 will process and print data on this printer for onsite production of all the plant's daily documents. This means they'll produce their own invoices, pickup slips and load reports almost immediately. No more waiting for courier deliveries. That's what I mean by decentralized operational control."

Is data also available interactively?

"Yes, both at plants and at headquarters. Information is always current and accessible for quick response tn any inquiries, including trend analysis and other management information programs.

"Incidentally, if we should acquire new plants, they can be added to the 3790 network by simply installing hardware. All our programs are written, assembled, tested and stored on our Model 145, ready for use when our plants need them.

"We think that extending computer power to the field via the 3790 is the way to go for many companies. It certainly is for Work Wear."



Rental uniforms being loaded at a Work Wear laundry for delivery to customers. The 3790 has meant greater control for Work Wear, from loading dock to corporate office.

Producing Customized Specifications with ATMS

Last year, the Boston-based engineering firm of Chas. T. Main, Inc., produced over 20,000 pages of design specifications for construction projects in the electric power, pulp and paper, printing and publishing, and general manufacturing industries.

"Whether the assignment involves the design of a new factory, plant additions, nr an environmental system," says Howard Broad, manager of data processing, "our business demands that we organize and edit pertinent information efficiently and accurately."

To meet what amounts to constant deadlines, engineers at Chas. T. Main use a comprehensive series of "master specifications", or standardized designs, and an IBM Program Product, the Advanced Text Management System. ATMS, a powerful editing and command language, allows the firm to retrieve master spec data stored on a System/370 Model 145 and to modify it to fit each new project.

The ATMS concept is simple. Any text material, once entered into the computer system, never needs to be re-entered. Simple editing commands and typing are used to make additions, deletions or changes.

"We've put all our master specs into the ATMS system," says Howard Broad. "If an engineer needs to specify a particular kind of pump in a utility system, he goes through a master index and checks off all paragraphs that pertain to that topic."

The request is then forwarded to an operator, who executes the text retrieval by typing in the ATMS commands on an IBM terminal linked to the computer. Within minutes, hard copy can be generated on an IBM 1403 high-speed printer, or at the operator's terminal. ATMS may also be used effectively with IBM 3277 Display Stations for text editing and proofing final output. Both methods eliminate time-consuming card punching and verification.

"The engineer can pencil in specific details, such as heights, weights and temperatures. These modifications can be entered at the terminal," says Howard Broad. "At the same time, irrelevant portions of the master spec can be deleted and additional paragraphs added. All new information is automatically stored on computer disks.

"Because large portions of the master specs don't need to be retyped or reproofread, ATMS has significantly improved our turnaround time. We've eliminated clerical overtime and substantially reduced our per-page production costs since we started using ATMS.

"Equally important, ATMS is helping us to assemble better master specs. With it, we are able to update continually such information as environmental standards, improved materials and new test procedures," he continues. "The more standardized and disciplined our specifications, the better we can serve our clients."



Based on specification reports developed under ATMS, models of new construction projects are created at Chas. T. Main, Inc.

DP Dialogue appears regularly in these pages. As its name suggests, we hope DP Dialogue will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

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75-6

CPE Goals Differ From Shop to Shop; Lack of Standard Measure Also Hurts

By John J. Hunter
Special to Computerworld

When a doctor takes your blood pressure, he usually tells you if it is high or low. If it is beyond an accepted, predefined limit, he advises corrective action.

Performance Evaluation

Unfortunately, the state of the art in Computer Performance Evaluation (CPE) is very far from this stage. Perhaps it must always remain so, for reasons we will discuss later.

At this point, the comments of Dr. J.C. Browne, editor of a leading CPU practitioner's journal, *Performance Evaluation Review* (PER), published by the Association for Computer Machinery's Special Interest Group on Measurement and Evaluation, are relevant:

"A principal problem in performance measurement and analysis is a lack of well-defined reasonable ranges for performance metrics, such as CPU, device utilization, throughput, response time, and others . . . PER solicits for publication case studies of performance measurement and analysis projects where reliable values of device utilization and other metrics were obtained in the context of a reasonably well-defined environment.

"Such data will be useful in establishing a basis for comparison which can be of great value to analysts with limited experience and to managers and administrators of data processing installations."

Why is there such a problem in establishing "good" values in absolute terms for CPD measurements? The answers lie in two basic observations: (1) There is no single measure of computer performance; and (2) every CPE shop is different. Let's expand on both of these ideas.

Every Shop Different

One of the first frustrations to hit the beginning CPE user is to successfully use his new tool, say, a hardware monitor, and discover his CPU busy rate is 53.8%.

When he tells his boss of his finding, the boss says "Is that good?" The analyst will usually have to say "It all depends."

Depends on what? A list of factors on which it depends would include throughput, user turnaround satisfaction, planned expansion and the feasibility of system replacement.

For a center that is doing all its work in eight hours, has no customer compliants, has no planned expansion and has a fully depreciated system, 53.8% is fine.

However, given these circumstances, 23.8% or 73.8% would also be fine.

For a center planning to double its workload, 73.8% CPU utilization is not fine. For yet another center, which feels it can do with a smaller system, 23.8% CPU utilization is low enough to indicate the matter should be seriously considered.

These examples illustrate the point that perhaps CPE measurements made in a vacuum will never be correct. They will probably always need to be viewed in terms of the center as a whole.

No Single Measure

The fact that there is no absolute value that expresses "goodness" for any single CPE measurement has prompted a trend in CPE to combine all measurements to get an overview of the system. The result is a single metric composed of the individual measurements.

One such approach is the Kiviat graph, which was presented to the general public in October 1973. Kiviat graphs are plots of common performance measurements that are usually portrayed by Gantt charts.

The graphs themselves are circular, with all axes originating at the center and terminating at the circumference. Although any value can arbitrarily be assigned to the axis, a common version of the graph has eight axes, with the vertical and horizontal axes used for parameters that are usually considered favorable. Examples are component utilization (CPU, channel) and overlap of component utilization. The diagonal axes are used for things that are considered unfavorable.

Following these conventions, measurements will produce shapes which are readily recognizable, both good and bad. The best theoretical shape is a four-pointed star, while nonoptimal conditions are indicated by deviations from this shape.

Although the Kiviat graph is not the perfect answer to the delemma of no single measurement, it has several very important benefits to new CPE users. First, its very existence indicates the need to look at a mix of variables simultaneously and not a single measure.

Second, it provides the benefit of more graphically presenting changes in system behavior over time, if the charts are updated on a regular basis.

While updated bar charts or tables would provide the same information, the degree of change in individual variables and changes in their interrelationships are much easier to see in the form of the changing shapes provided by the Kiviat graph.

The third advantage of the Kiviat graph comes from using the eight axes in a standard manner. This scheme involves the use of each of the eight axes for a specific function.

For example, the first vertical axis is used to represent CPU utilization, while the first horizontal axis is used to represent CPU and channel overlap. When this scheme is followed, the resulting shapes can be compared with a series of standard shapes, each associated with some system condition.

A system that is I/O-bound, for instance, will have a shape called an "I/O wedge," while one that is CPU-bound will be a "CPU sailboat." A well-balanced system will have the previously mentioned four-pointed star shape.

Although the Kiviat graph has some technical limitations that prevent it from being a CPE standard, it is a step forward in an area in need of progress. The popularity of the graph is attested to by the fact that one hardware and one software monitor vendor recently added it as an option in data reduction software.

One of the factors working against the use of standard numbers, or even standard shapes, as an absolute measure of goodness is the variability in DP center workloads.

Above all, common sense and judgement must prevail, as they should in all aspects of CPE.

This article was extracted from a 20-page "Product Class Report" on CPE recently released by Auerbach Publishers, Inc. of Philadelphia, where Hunter serves as software editor.

Linkpack Usage Eyed by 'CUE'

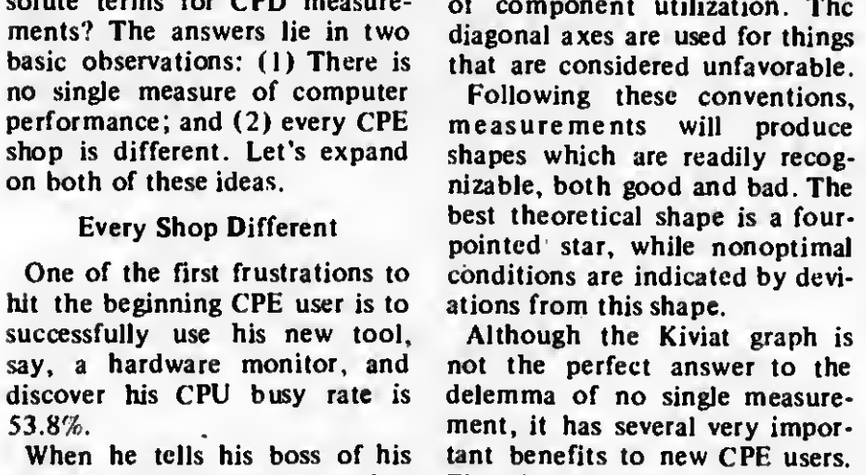
SUNNYVALE, Calif. – An option now available with the Configuration Utilization Evaluator (CUE) from Boole & Babbage measures the activity of modules in the Linkpack Area.

Measures such as CPU Busy, Page Residency Time, Page on APQ, Page Being Input, Page Fixed and the percent of the total Linkpack page faults which are attributable to each module are given.

With this information, the user can pack those modules with high activity into the smallest number of pages, thereby reducing paging and reducing the Linkpack Area working set, the vendor said.

CUE is a software measurement tool which determines the activity of resources in the system as well as queueing of tasks waiting for these resources.

The Linkpage Area Usage option is available for IBM's VS1 or VS2. The option is available for $1,750 from Boole & Babbage at 850 Stewart Drive, 94086.



ONE SOURCE, ONE ORDER FOR SYSTEM 32 SUPPLIES

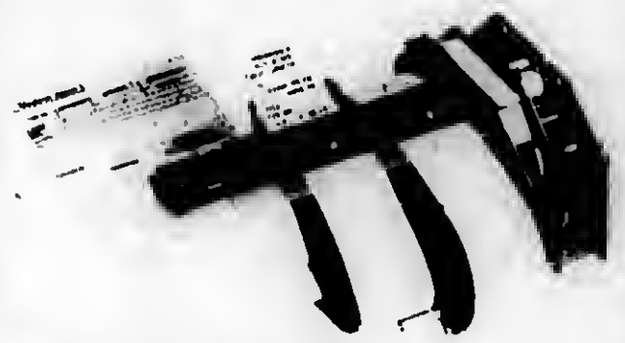
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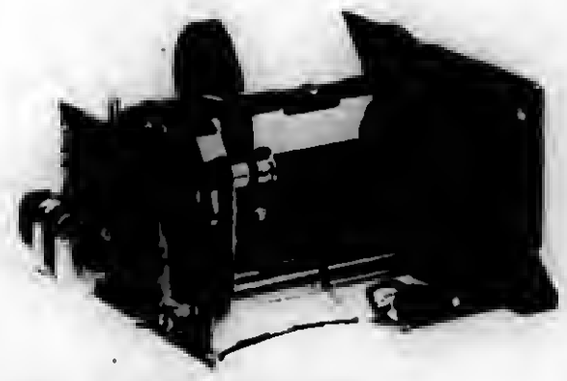
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DOS Partitions Balanced

NEW YORK – A partition-balancing system that controls priorities dynamically under IBM DOS or DOS/VS, EQULPRTY from Labyrinth Systems Ltd., may be able to increase a user's throughput 30%.

The console operator is free to designate which partitions are under the balancer's control at any time.

EQULPRTY works by continuously checking each partition for which it is responsible. When an executing program is in an I/O-bound phase, its partition is immediately assigned a higher priority. When it is in a CPU-bound phase, the priority is lowered by the system.

Improvements of as much as 30% can mean cost savings in overtime pay or additional shifts, the vendor continued. Cost of the improved performance, according to Labyrinthe, is "about five minutes in a 24-hour day," and $1,995.

The vendor is at 2 Penn Plaza, 10001.

For Training and Tuning

Service Backs CPE Novices, Experts

RESTON, Va. – DP managers looking for help in establishing or supporting computer performance evaluation (CPE) efforts within their own installations or interested in having a CPE team come in from outside may be able to use the consulting services of CACI, Inc.

Four individual categories of analysis have been identified as targets for the new operation: DP center management, systems planning, applications development and fiscal management.

The focus can be on the user's rapidly expanding work schedules, rising costs or the need for extensive budget and planning activities, CACI noted.

The consultants expect to provide whatever level of support seems worthwhile, from one-time visits to solve specific problems to regularly scheduled visits on an annual retainer basis. CACI will use whatever CPE or CPE-related tools the user already has or it will bring in the tools it needs to use.

In addition to reviewing a user's performance, CACI will make recommendations and cost estimates of the proposed changes and will, if the user wishes, support the implementation of the modifications.

Organization and training of user staff to run its own in-house CPE activity – or evaluation of how well an existing CPE group is doing – is still another service CACI can now provide, a spokesman said.

The CACI staff has had "considerable experience" in monitoring Control Data Corp., IBM and Univac systems, he added, but the concepts behind CPE can generally be applied to any installation willing to devote time, staff and funding to the project.

The need for and value of CPE increases with the complexity of the computer system and rising DP costs, the consultant noted.

The CPE services are being managed by CACI Inc.-Federal, 1920 Association Drive, 22091.

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Cosmic 'Vicar' Manages Images

ATHENS, Ga. – The Video Image Communication and Retrieval (Vicar) system from the Cosmic clearinghouse is an expandable library of application programs and a supervisory control program designed to ease the acquisition, digital processing and recording of image data.

Intended primarily for IBM OS/360-370 users, the application programs perform image-processing functions such as picture comparison, expansion, two-dimensional convolution filtering, geometric transformation and other image-enhancement operations, a Cosmic source said.

The user accesses these services through command instructions supported by the control program. The specifics of the operation required at a given time are defined by the operands with which the user completes the commands, the spokesman added.

Vicar is said to require minimal programming knowledge and little data input from the user. The system also uses self-contained specialized I/O routines intended to reduce library and main memory requirements.

Currently the application library contains more than 200 processing programs, Cosmic said, adding all use standard Vicar support facilities. Vicar itself is available for use under OS/360-370 or, in a special packaging, under 44/PS on the IBM 360/44.

Described as 60% Fortran and 40% IBM Assembler, Vicar is made up of "approximately 82,000 source statements." The OS version cataloged by Cosmic as GSC-12706/CW and the 44/PS version (NPO-13415/CW) are each available to U.S. users for $1,670, with documentation separately priced at $88.

Cosmic is at Suite 112, Barrow Hall, University of Georgia, here in Athens, 30602.

Bring Better Control

POS Systems Improve Food Operations

CHICAGO – Faster operations, greater accuracy and better management control are benefits resulting from the operation of computer-based, point-of-sale (POS) accounting systems by Interstate Tower Restaurants.

A division of Interstate United Corp., Interstate Tower Restaurants runs five restauranta in the new Sears Tower here. POS accounting systems are operated in three of the five – a coffee shop, a dining room and a pub with food service.

"The POS accounting systems make it possible to speedily and accurately price all items," according to Don Stanczak, general manager. "Sales tax is also automatically calculated, eliminating the possibility of tax errors or omissions.

"The systems record every item sold and every check used," he pointed out. "As a result, we have complete cash and check control.

"Overall, we're able to obtain more information faster," Stanczak said. "For example, we can get a report on the number of each type of item sold at any time of the day, providng us with an instant analysis of product mix. As a result, we're able to maintain better management control."

Produced by the Data Systems Division of Addressograph Multigraph Corp., the Documentor POS systems include a processor with a minimum of 4,000 bytes of memory, a master terminal and multiple remote terminals. Both the master and remote terminals have a multicolumn printer, visual numeric display and up to two cash drawers.

The terminals are also equipped with document readers capable of scanning pencil markings on customer checks preprinted with up to 120 menu items. The customer checks are printed on Wausau Mills Company's oil- and grease-resistant paper, which is treated with "Scotchban" brand paper protector to eliminate oil and grease stains which otherwise might be incorrectly interpreted as pencil marks.

Interstate operates the POS systems in different configurations in each of the three restaurant locations. The Dutch Corner coffee shop uses two terminals, one master and one remote unit, in its cashier operations and one remote terminal in its kitchen.

The Franklin Inn dining room operates a master cashier terminal and two remote kitchen terminals. The Dinghy Pub has one master cashier terminal and a single remote kitchen terminal.



Documentor remote terminal reads customer checks, calculates sales taxes, prints out total amounts and visually displays amounts in 1.5 sec for three Sears Tower restaurants.

When waitresses take orders, they make pencil marks in appropriate boxes on the preprinted customer checks and place these checks in the entry trays of the remote kitchen terminals. The terminals read the checks, calculate sales taxes, print out total amounts and visually display amounts in 1.5 sec.

If an error is made in marking, the check is rejected while an error code is displayed, identifying the source of the error so it can be corrected.

Waitresses must process all customer checks on kitchen remote terminals before presenting the checks to the kitchen for order filling, thus ensuring each customer order is fully captured by the POS system. Waitresses then present food orders and checks to customers.

When customers leave, they present the checks and payments to cashiers who process them on the cashier terminals, completing transactions. As a by-product of terminal operations, all data is stored in memory for recall on a need-to-know basis.

Variety of Reports

At any time of the day, the master terminals can then be used to produce a variety of different reports. Summary reports, for example, show the number of each different type of item sold, making it possible to plan purchases and control inventory better.

A waitress productivity report shows sales by class of item in terms of items and dollars. Waitress tip reports, missing check reports and item price lists can also be produced at any time.

At the end of each day, complete revenue and cash reports are automatically produced for balancing purposes.

"The systems were not installed without problems," Stanczak said. "There was a breaking-in period during which our people had to learn to understand and properly use the systems.

"However, the systems are now running smoothly and providing increased speed, accuracy and control, enabling us to do a better job of management," he concluded.

DAA Death Brings Query: 'Now What?'

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – After the DAA, what?

That is the question being asked in the wake of the Federal Communications Commission's (FCC) decision to eliminate the need for Data Access Arrangements as of April 1976 [CW, Nov. 12].

The biggest question mark associated with the FCC's ruling is what AT&T will do next. A Bell spokesman said the phone company is still carefully reviewing the decision, but its exact reaction has not yet been determined.

Meanwhile, some users are speculating on what the data communications environment will be like when DAAs are no longer required – and they are getting few answers from their suppliers.

There is, of course, that simple option of doing nothing. The FCC has made provision for a "grandfather clause" that would allow all installed DAAs to remain in place on dial-up lines behind noncarrier modems.

Presumably this set-up would remain intact as long as the user can resist sales pressures from his vendor to change.

Status Quo Not Viable

But the status quo is not a viable solution. Obviously users will want to eliminate the recurring monthly rental for the DAA in favor of a device which could be purchased and written off for tax purposes.

The FCC ruling gives vendors (and users) the option of getting their modems certified by an outside agency and then registered for use by the FCC. This procedure assumes the inclusion of protective circuitry similar to the DAA inside the certified and registered unit.

The simplest way to add the protective circuitry to an installed modem would be to add a circuit board in the field. But

Analysis

most noncarrier modems do not have provision for such an added board.

The board itself would be relatively low-cost, probably about $50 for a manual DAA equivalent and about $100 for an automatic DAA equivalent. But if the data set could not handle such a field change, it might have to be returned to the supplier for modification.

If so, what would the user do while his modem was being retrofitted?

For the user who decides to have his noncarrier modems certified on his own, the cost probably would range somewhere between $2,000 and $5,000. That is the estimate required to meet the California certification standards [Oct. 29]. And the FCC certification tests were described as somewhat less severe by engineering experts.

Affect on Quality

If users begin using certified/registered devices on dial-up lines, the quality of the phone facilities might be affected, according to one user.

The phone company usually makes an effort to provide a clean local loop to the nearest central office when a DAA is being installed, this user said. Without a DAA, the phone installer might merely provide the termination block for a user to hard-wire a certified/registered unit, he said.

A check with the phone company confirmed Bell has standard practices associated with line quality when a customer orders a Bell data set or a DAA. The exact procedures vary with the speed that data will be transmitted, but local representatives will provide a clean local loop that is tailored for data use, an AT&T technical expert said.

One of the most interesting alternatives for the user with a large installed number of noncarrier modems and DAAs would be to buy the DAAs from the phone company. With an estimated 120,000 DAAs of all types in the field, Bell might look for a graceful way to dispose of the couplers, and selling them to the owners of the modems might be one way out.

But that would leave the question of maintenance. Will Bell maintain DAAs it no longer owns or will the user have to assume this task?

One regulatory expert said it was premature to raise this type of question. In his opinion, Bell will delay the implementation of a non-DAA environment as long as possible by using regulatory and legal means.

No matter how long the various appeals take, the user will one day have to address the question: "After the DAA, what do I do?"

So far there are few answers.

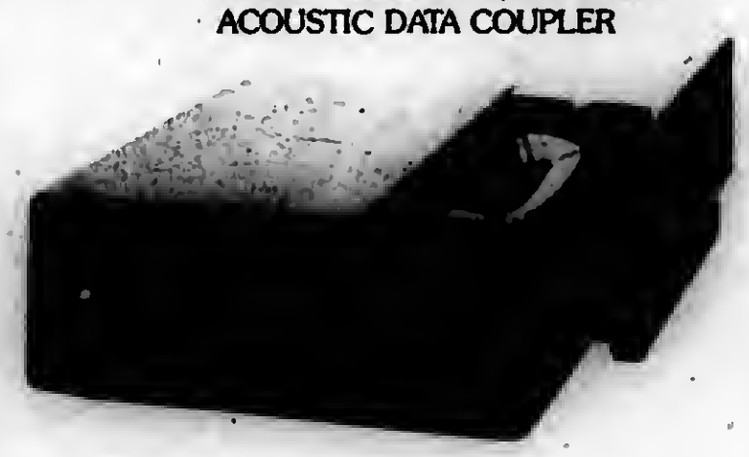
Dataspeed 40 Rates Filed

WASHINGTON, D.C. – AT&T has filed tariffs to cover its synchronous clustered configurations of the Dataspeed 40 CRT [CW, Nov. 12].

The interstate rates will go into effect on Dec. 18 unless suspended by the Federal Communications Commission.

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Packet-Switched Net to Offer 'Virtual Circuit' Service

TORONTO – The packet-switched Datapac network will be providing a "virtual circuit type of service" when it begins operations in mid-1976, according to A.M. McMahon, vice-president of the Computer Communications Group at Bell Canada.

Speaking at a recent conference sponsored by the Canadian Information Processing Society here, McMahon said three basic Datapac services will be offered initially.

The first, called Datapac 1000 service, is aimed at point-of-sale and credit-check users. It will support essentially dumb terminals through what is known as a Network Interface Machine (NIM) and allow access to a variety of data bases.

The second service, Datapac 1500, will allow intelligent terminals using the Standard Network Access Protocol (Snap) to access a variety of host computers that also use Snap.

This service is aimed at the inquiry-response user, with particular emphasis on elements of the payment system, such as on-line banking, McMahon said.

The third service is Datapac 2100, which also uses a NIM. It will support teletypewriter terminals at the input/output end and interface with host computers in a Snap format. It is aimed at the time-sharing user.

Four Serving Exchanges

Initially, there will be four Datapac serving exchanges in Canada. These will be located in Montreal, Toronto, Ottawa and Calgary.

Between 1976 and 1980, about 16 additional nodes will be added as required. However, from the start, the rates will assume the existence of 20 Datapac serving exchanges.

Internal trunking between the nodes will be on 56K-bit synchronous digital Dataroute facilities. The Datapac switch, developed by Bell Northern Research and built by the Northern Electric Company, is a multiprocessor data switching machine with both packet and circuit switching capabilities.

The entire system is a product of Canadian design, engineering and manufacture, McMahon noted.

A number of modes of operation will be supported. The mode that will give the most complete range of benefits is the one using the Snap protocol, McMahon said, noting this will require having intelligent terminals and computers equipped with Snap.

Service to nonintelligent terminals will be provided by the use of NIMs. These NIMs will provide the terminal handling, concentrating and packetizing functions for presentation of this traffic to the network.

For the remote job entry type of terminals, there will be a frame-switching mode of operation. For data transfer between these terminals and their host computers, the network will be transparent and will provide a virtual circuit connection, he said.

Situation 'Promising'

McMahon said "the situation looks very promising for agreement on an international basis on a basic packet network protocol."

Eleven months ago, a set of preliminary specifications for the Snap protocol was introduced. "At that time, we said we wanted to have as much feedback as possible from users, universities, computer and terminal manufacturers, fellow carriers around the world and international standards organizations, with a view to improving this protocol to the greatest extent possible," he said.

Carriers Agree on Protocol

As a result of these discussions, the Snap protocol has undergone some significant changes. The world's major carriers (those involved in packet switching) are basically in agreement on the protocol that has evolved, McMahon said.

"The current status is that we hope to have a recommendation going forward to the February 1976 meeting of Study Group 7, which will turn it over to the 1976 Plenary Assembly of the CCITT for final approval," he added.

Speea Coming

In the meantime, Bell Canada will be publishing firm specifications for the Snap protocol this month. It will be a protocol that essentially has the concurrence of the major carriers involved in packet switching, McMahon said.

The protocol will be a nonproprietary protocol that any carrier, any user and any manufacturer – anywhere – will be free to adopt, he added.

The Datapac network has been working for a few months in a technology trial operating between Toronto, Montreal and Ottawa. This three-node trial will be expanded to a four-node, real-life trial phase early next year with a number of customers using it.

Serviee in July

Commercial service will start in July 1976 with the three services, he said.

In the spring of next year, the British plan to start operating a packet-switched service, experimentally. Telenet in the U.S. is already operating a commercial packet network. France will introduce its Transpac network in 1977 and Japan plans to start packet service in 1977 or early 1978, he said.

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Net Reduces Firm's Inventory, Allows Same-Day Shipments

Special to Computerworld

MINNEAPOLIS – Using a network of intelligent terminals linked to computers, Van Dusen Air, Inc. not only reduced inventory levels and the investment associated with them, but also initiated a successful program of same-day shipments.

"Our primary objective was not to save money, but to improve service," William Larson, corporate DP manager, said.

Before the present network was established, Van Dusen used a manual Kardex system at each branch office to determine if inventory was in stock.

Each of its 20 domestic sales offices carried a complete inventory of diverse items, resulting in a large financial investment, frequent shortages of some items and delays in getting out-of-stock items to customers.

If an item was out of stock, the branch office mailed a requisition to its central warehouse at St. Louis for processing. The order would be keypunched and processed, pulled from inventory, grouped by the branch office and trucked on a weekly scheduled basis to the appropriate branch sales location where it would be distributed to the customer.

To cut down the required inventory investment at the individual branch offices and to reduce the time delays in getting out-of-stock items to customers, Van Dusen set up a network of three regional sales support centers in Teterboro, N.J.; St. Louis; and Los Angeles. In each, Van Dusen placed a System/3.

Larson explained that this relieved the individual offices of having to stock a full inventory of more than 10,000 items. The branches now carry the approximate 2,000 items which account for over 85% of their sales activity.

Communications Needed

However, this did not solve the more basic problem of how to distribute the inventory. To do that, Larson began a serach for a communications terminal.

His criterion was for a reasonably simple communications device, "because we are not a big IBM 370 user with hundreds of programmers to dedicate to any one project."

He also wanted a device which would be easy to relate to at the business end "with a CRT to follow the bouncing ball" and simple to install at a corporate level.

In February 1974, the first of these devices, a Sycor Model 340 intelligent terminal, was installed; by the fall of that year, terminals were in place at all 20 domestic locations. Since then, Sycor units have been installed in Winnipeg and Montreal, Canada.

Today, the network of Model 340s and System/3s is part of a system known as "Today Sure Order" (TSO). The system ensures that, if any order for an out-of-stock item is received at a branch office by 2:00 p.m., the item will be shipped the same day from the nearest sales support center direct to the customer.

Unattended Polling

Orders are placed through the terminal's typewriter-like keyboard during the day by entering a seven-digit customer account number and a six-digit (modulus 11 check digit) stock item number. The data is then polled unattended two or three times a day by the System/3 to find the out-of-stock items that must be shipped.

Acknowledgements of the orders are then transmitted back to the offices where they are printed out on 80 card/sec Sycor printers. The hard-copy report lets branch managers know the data was received and received correctly, so they can advise customers accordingly.

Later that evening, an updated inventory of the more than 10,000 items in stock at the regional sales support centers is sent to each branch office.

While Van Dusen Air still uses a manual Kardex system to fill orders from inventory in branch stock, future plans are for a terminal device to be used to handle on-site inventory control to relieve branch personnel of tedious Kardex maintenance work.

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Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

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How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

New York	**Essex House**	**Jan. 26-27**
Chicago	**Hyatt Regency O'Hare**	**Mar. 8-9**
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Wash., D.C.	**Marriott Crystal City**	**Feb. 4-6**
Orlando, Fla.	**Sheraton Towers**	**Feb. 18-20**
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New York		**Jan. 26-27**
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Data Communications Course #1020 – Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

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Three Alternative Communications Futures Predicted

OTTAWA – "The place of telecommunications – and, in a larger sense, of information technology – will be pivotal in the world now being reshaped," according to Dr. John M. Richardson, acting director of the U.S. Department of Commerce's Office of Telecommunications.

And yet, when ascertaining the forces of change on a national and international scale, "we really have no choice but to engage in some prophecy," Richardson remarked in a speech to the Canadian Information Processing Society here recently.

"I suggest that when we think about the impact of telecommunications, it may help to do so in terms of three alternative futures," he said.

"I have in mind, first, a 'technology-driven future'; second, a 'public policy-driven future'; and, finally, a 'market-driven future.'

"The total future of telecommunications will therefore be a complex mixture of market forces, political pressures and the dictates of technological development. But looming over all of this will be the greater phenomenon we call 'information technology,'" he continued.

"By the year 2000, surely, this 'information society,' with all its complexity, will be upon us. This special technology cannot be viewed in isolation. It will be part of a much greater whole," he predicted.

Technology-Driven Future

"The technical forces for change will be led by three key developments: the large-scale integration of electronic circuits; optical fiber communications; and the satellite, especially the higher powered variety," Richardson said.

"The first technology, massive integration of electronic circuits, gets us quickly to the heart of the information society: the linkage between the computer and sophisticated telecommunications technology," he said.

"Well before the turn of the century, we shall be working with 'smart' computer terminals in a multitude of ways.

"In 10 years we will have developed the hardware and software for local smart terminals that will do much of the logic and decision making now referred to a large remote computer by long-distance transmission.

"Moreover, it is the fast-developing digital world of data transmission that will, first, simplify the compatibility of smart terminals and communications lines and, second, reduce the cost of transmission to economic levels," he predicted.

Policy-Driven Future

The public policy-driven future will be characterized by central government planning done in the public interest. "The point is that telecommunications will reach such economic and social importance governments will wish to shape its development more positively. Technologically advanced systems will require more extensive regulation.

"In addition, it may become mandatory to plan multiuse systems so costs can be shared among many information-related public services such as health, employment and welfare," he said.

"As to the regulation, the avalanche of data that before long will be swirling about us thanks to the phenomenon of information technology will make imperative whole shelves of novel legislation. And to be sure, a corpus of such laws is now developing.

"It is important that we in the field become familiar with the areas most subject to this growing legislative activity," he stressed.

"Before we can have public policy problems to solve, we must first have the telecommunications systems in operation. And that implies the existence of buyers for them.

"Much of our available technology will lie dormant until a market appears to activate it," Richardson said.

"But in some cases, cost is not the problem," he said, citing the regulation barrier.

"If the way is cleared, in seven to 10 years we ought to have in our homes the services I described – everything from the library search to the want ads.

"Whatever turn the price mechanism takes, all the signs point to its happening on an international scale.

"Here is an authentic bright spot for telecommunications businessmen – they can count on a world market," Richardson said.

"Arthur D. Little, Inc. predicted a world market of telecommunications equipment of at least $40 billion a year by 1980, compared with today's total of only $15 billion."

"This will arise partly from the efforts of the less developed countries to achieve telecommunications parity with the advanced nations.

"Rest assured, however, that no single firm will be permitted to dominate this field. Valid national security considerations will demand that each nation take steps to ensure its telecommunications destiny remains in its own hands," he said.



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Interfaces With Police Net

On-Line System Speeds Updating of Drivers' Licenses

Special to Computerworld

OLYMPIA, Wash. – Despite the obvious difficulties associated with two aging, overloaded computers, the Washington State Department of Motor Vehicles has been accomplishing on-line updating of records for a number of years.

The department has responsibility for driver licensing, vehicle registration and titling, fuel tax collection and proration, as well as licensing, registration and regulation for over 170 businesses, professions and occupations.

In addition, the department's Information Systems Division provides data processing services to several other agencies and commissions such as the Department of Labor and Industries, the Secretary of State's Office, State Board of Pharmacy and the State Gambling Commission.

In 1967, an existing IBM 1401/1410 magnetic tape batch system was converted to a dual Univac 70/45 on-line real-time computer system using 70/752 CRT terminals for input and 70/568-11 magnetic card mass-storage units for random access data storage. The dual 70/45s each have 262K bytes of main memory.

Under the old system, the vehicle titling process involved clerical receiving, title examination and coding followed by key-punch, key verification and batched input.

The new system involves a clerical receiving function followed by CRT terminal direct key-entry input to the random access files.

Employees, to function as combination title examiners and key-entry operators, were recruited from among existing title examiners and keypunch operators.

The title examiners/terminal operators now overlap the two processes by examining the next title for completeness and accuracy while awaiting the CRT display response from the previous title inquiry. Thus, when the record is displayed on the CRT screen, the perfected title is ready for the operator to key-in the record update transaction.

The normal 6-second to 7-second response time is adequate to permit optimum operator transactions.

Under the old system, the vehicle title backlog at times amounted to 120 calendar days of unprocessed transactions. Since conversion, the normal vehicle titling turnaround time is 10 days or less.

Field Station Access

In June 1968 a CRT video data terminal, connected to the computer by a leased voice-grade telephone line, was installed in the Olympia Drivers License Examining Station as a pilot to test the feasibility of field station on-line access.

Under the concept, an applicant's driving record is accessed and displayed on the CRT screen while the applicant is being tested or examined. The applicant's eligibility is established before a license is issued or renewed.

There are now over 280 terminals, including law enforcement, in-house and driver license examining stations, with on-line access to computer records.

Centronics Adds Impact Printers

HUDSON, N.H. – The Centronics Data Computer Corp.'s models 103 and 503 serial impact printers can provide 340 line/min output from either a CRT terminal or a minicomputer system, according to the firm.

The two models have electronics which permit bidirectional printing and the ability to logically seek the fastest path to the next print line, Centronics said.

A self-contained test print capability is offered as a standard feature on the Model 103 and as an option on the Model 503. The operator can use this capability to exercise the printer off-line to set up forms and check the printer's operations.

The printers can be linked to minicomputers and terminals through either serial, RS-232 or individual vendor interfaces, Centronics said.

The models 103 and 503 offer similar performance and features. The Model 103, however, has standard features that are compatible with earlier Centronics 100 series printers.

The Model 503 serves as a basic unit for the new customer or for the current Centronics 500 series customer who needs higher throughput, the company said.

The Model 103 costs $4,340 and the Model 503 $3,565. Deliveries will begin this month and in January respectively from the firm here in Hudson, 03051.

If you aren't keeping all the users of data processing happy and satisfied, it's time to discover Tesdata MS.

Tesdata MS is a new kind of management tool that enables today's data processing manager to manage and control complex computer systems operations with greater ease and certainty. The number one reason in most installations for customer dissatisfaction can be directly traced to a data center's lack of sufficient information in a timely fashion concerning its own operations. Tesdata MS offers you the kind of capability needed to effectively run a large scale data processing operation. MS is your management and control system—your performance measurement system—your barometer and problem solver. MS has the ability to not only collect very accurate data but, most importantly, its data base and analytical capability provides an effective and convenient means for really using the data. The combination gives you what you need.

With Tesdata MS . . .

- Operations can instantaneously detect down time and status changes.
- Management can receive usage analysis reports in graphic form that show the trends; and sophisticated exception reports; formats are variable and obtaining them is almost instantaneous and relatively routine.
- Systems personnel can evaluate VS systems' working sets with the MS Working Set Monitor and modify the program layout to improve working set locality.
- CPE analysts can use their time analyzing reports effectively with our exception reporting techniques and eliminate the tedious task of reviewing pages upon pages of measurement data and putting it together manually.
- Planning staffs can look in detail at the systems and insure that system resource requirements are really what's needed and avoid very costly errors. (And, coming soon from Tesdata will be MS CASE, a simulation system for MS which will provide even more capability for the planner.)
- Real time reports on usage can be automatic and these can be beneficial to operations, programming, or systems personnel.
- Top corporate management can feel comfortable that data processing management is doing its complete management job and credibility automatically increases.

Who's buying Tesdata MS systems? Many of the world's largest users of data processing systems are renting or purchasing MS systems. Most importantly, Tesdata's previous customers are also buying—a large business equipment manufacturer just installed an MS system, its third large Tesdata system; a major chemical company just installed two MS systems and traded-in an older Tesdata system it had used for two years; one of the country's largest life insurance companies is trading its older Tesdata system for an MS88; the same with a large midwest industrial concern. Tesdata's systems have proven that they provide honest benefits to their users or we wouldn't have so many of our customers upgrading and adding systems.

To learn more about Tesdata MS, contact your Tesdata representative (we have offices worldwide!) or corporate headquarters: Tesdata Systems Corporation/7900 Westpark Drive/McLean, Va. 22101/(703) 790-5580/Telex: 89-9489.



Tesdata MS
A New Era in Computer Management

The Varian System It Comes in Many Flavors

When your complex information processing problems demand more than traditional solutions, then you need the Varian System.

The Varian System is a broad, open-ended selection of computer hardware, firmware and software that gives you the speed, performance and flexibility that allows you to design your own computer package to meet the specific demands of your business.

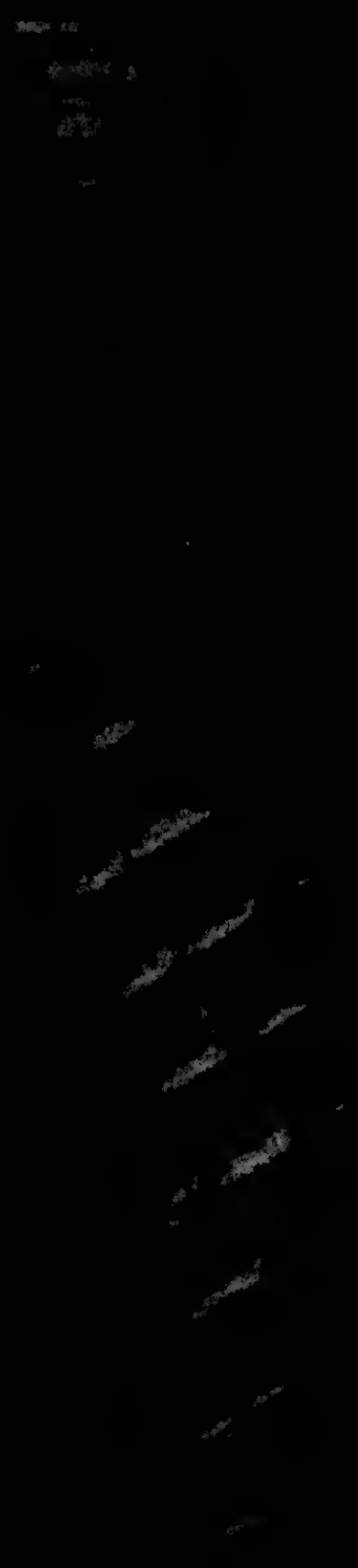
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Micro-programmable 330ns processors give you high performance



Varian's 480/3-WCS decade processing and memory capacity you even higher throughput of data during these critical run times.

A wide range of peripherals and special interfaces, four I/O techniques and dual port memory access also let you configure your system for maximum I/O throughput.

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Whatever your taste, contact any of our offices throughout the world, or Varian Data Machines, 2722 Michelson Drive, P.O. Box C-19504b, Irvine, California 92713, (714) 833-2400. In Europe, contact Varian Associates Ltd., Molesey Road, Walton-on-Thames, Surrey, England. Telephone 26-7666.

Helping a Fast World Move Faster

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BCM Multimedia System Links Key-to-Disk, OCR

By Patrick Ward
Of the CW Staff

BOSTON – Blue Cross of Massachusetts (BCM) has a "mind-boggling" data-entry problem that no one technique can handle effectively, according to Robert Guida, manager of BCM's data-entry division.

In 1974, BCM captured 1.54 billion characters through its various data-entry methods, he noted.

One of BCM's answers to the problem is a "multimedia" key-to-disk optical character recognition (OCR) system that combines the advantages of both approaches, said Guida, who is director of the BCM multimedia center.

BCM continues to use shared processor, keypunch and on-line data entry for applications where they are appropriate, he said.

BCM first turned to OCR in 1972 to handle turnaround billing remittance forms from subscribers. Other applications followed.

One of the applications called for BCM to input alpha as well as numeric handprint information into the scanning system, "but this type of scanning is as yet unproven," Guida said.

"That led us to look for a solution that would allow us to scan as much data as we could on a document and then key enter the rest," he said.

When BCM installed a Scan-Data Corp. 2250/1 scanner system last spring, it soon interfaced it with a 10-station Scan-Data 2250/2 key-to-disk system. Each system has its own controller, but the OCR system shares the key-to-disk system's disks.

Correcting Documents

Currently users handprint alphanumeric information on turnaround correction documents which go directly into the scanner. This document has both OCR A characters and handprint alphanumerics on it.

The Scanplex 1 CRT directly attached to the scanning unit is used for correction of all rejected OCR A and numeric handprint characters, Guida explained. A 2250/2 terminal attached to the 2250/2 key-to-disk system is used for entry of the handprint alpha characters the system can't recognize, he added.



CRT operators in the Blue Cross of Massachusetts Multimedia Center can both correct rejected characters and key in nonscannable data as the OCR system reads documents.

While the entry of the alpha characters for the application goes on in the multimedia room itself, user departments also key in nonscannable documents through remote 2250/2 stations.

This was one job formerly done at BCM's central data conversion shop, but since the 2250/2 keystations can be located apart from their processor, tBM decided to shift this key-entry function out to the users.

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The user can key in at his 2250/2 terminals, batch balance the results and then release the data to the mixed-media system when he is satisfied with its correctness, Guida said.

This prevents flow of correction documents back and forth between the user departments and the mixed-media system, he said.

"We can be scanning documents, we can be correcting rejected characters from a previous scanning job or we can be entering additional data either locally or remotely into the 2250/2 system all concurrently," he said.

NCR Adds Multiple-Use Cash Register

DAYTON, Ohio – NCR Corp. has expanded its family of electronic cash registers with the introduction of the NCR 225, available in two versions.

Equipped with a microprocessor, the NCR 225 is being offered to perform back-office tasks such as check endorsement, end-of-day balancing and auditing.

Such tasks are simplified through individual identification of cashiers and through identification and automatic totaling of the various media used for payment, the firm said.

As a report printer, it can produce a variety of department, financial and exception reports.

In addition to automatic tax calculation, quantity extension and item repeat, the 225 offers Clear, Error Correct and Void keys which can be used to correct entry errors during a transaction.



NCR 225

The general-purpose model, priced at $2,695, is designed for department and specialty stores, variety stores, supermarkets, discount stores and other general retail outlets.

The "preset" model, which was developed for restaurants and fast-food operations, features up to 36 preset keys and is priced at $2,895.

Function keys are color-coded to aid cashiers in their transition from electromechanical to electronic registers, NCR noted.

The 225's three separate printers simultaneously print a customer receipt and a sales journal and validate inserted forms with register-printed figures. As an option, the 225 can be programmed to require insertion of a form on all charge transactions.

The 225 can handle any type of transaction at the point of service, including cash, charge, check, credit card, return, received-on-account, refund and paid-out transactions, the firm said.

Charge transactions are handled the same as cash up to the final key entry. The 225 can also enter a previous balance and update a customer's charge account card and monthly statement.

On completion of the charge transaction, the customer has audited the account and has given an account statement as of the last transaction. As the customer leaves the store, both the customer and the store know the status of the account as of the last transaction, an NCR spokesman said.

The general-purpose 225 is available for immediate customer delivery. The preset model will be available this month.

CDI Has Entry-Level Monitor

WATERLOO, Ont. – The Model 3000 Tricorder from Computer Performance Instrumentation, Inc. (CPI) is an entry-level hardware monitor for the mid-range computer user.

Costing $4,950, the Model 3000 can help users keep track of CPU or peripherals utilization, CPI said. The device can also ease the user's scheduling task by identifying loads on the system, a spokesman said.

The basic Model 3000 captures performance data through its 12 probes and displays it in real time on one or more video screens. Chart or pen recorder output is also standard.

The optional Model 3350 recorder/communicator has a cassette which stores 24 hours of performance data. The recorder/communicator can emulate an Ascii terminal to transmit that data back to the mainframe.

Alternatively, the host CPU can repeatedly poll the recorder/communicator to make sure the system has not exceeded a performance parameter set by the user. If the system has, an alarm sounds.

Data can also be collected on the optional Model 3460 1/2-in. magnetic tape controller, the spokesman noted.

In addition to the hardware, CPI provides software that can analyze the recorded data. Presently the firm is offering software for both IBM 360 and 370 machines and the Honeywell 6000 series, according to the spokesman.

This software can produce reports on system utilization or the percentage of time a channel was active, CPI said.

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CPI is at 572-7 Weber St. N., N2L 5C6.

We'll service your mixed vendor system better than your mixed vendors.

Because at Raytheon Service Company we have *more* experienced field reps who are trained to service *more* types of equipment than any one else in the business — whether manufacturer or service company.

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So, when Raytheon handles your service, you don't worry about which piece of hardware is the problem. Your RSC rep will troubleshoot the complete system. That's fast, and cost-efficient.

We're proving just how fast and cost-efficient our single-source service is for a growing number of mixed vendor system user/customers. Major national and international airlines. Leading industrial firms. And governmental agencies. They think single-source service makes sense. We do too. We'd like to show you why. For the whole story, contact Mike Salter, Director, Commercial Marketing, Raytheon Service Company, 12 Second Avenue, Burlington, Mass. 01803. (617) 272-9300.

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SYSTEMS & PERIPHERALS

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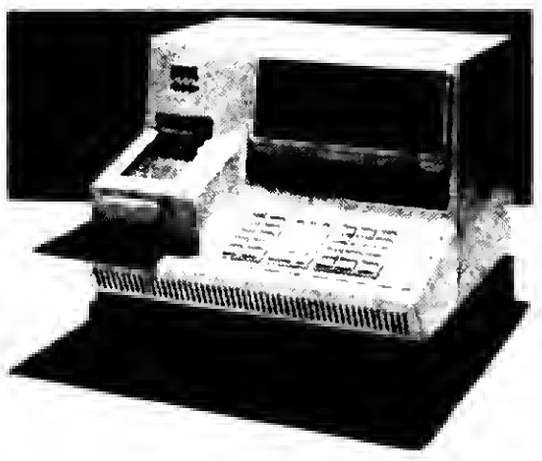
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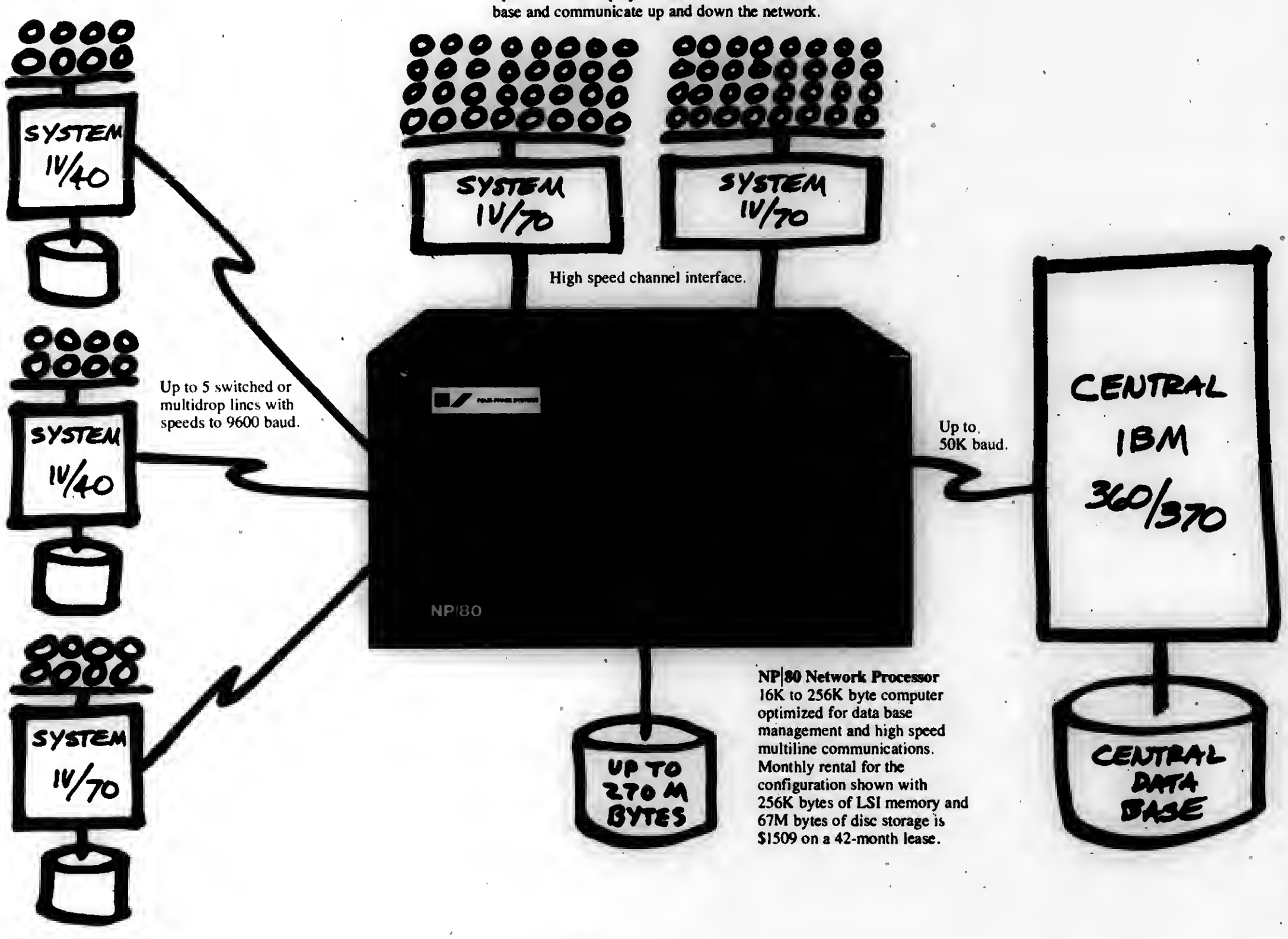
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RAYTHEON

NP|80: The new Network Processor that distributes your data the way your company is organized.

Remote locations with up to 32 displays per system.

Up to 64 local displays can access the NP|80 data base and communicate up and down the network.



NP|80 Network Processor
16K to 256K byte computer optimized for data base management and high speed multiline communications. Monthly rental for the configuration shown with 256K bytes of LSI memory and 67M bytes of disc storage is $1509 on a 42-month lease.

Remote Locations **Regional Center** **Central Office**

Hierarchical networks for hierarchical organizations.

Makes sense doesn't it. Ideally, information should flow up and down a network as it does in an organization . . . with geographically distributed files at branch, district, and regional locations in keeping with departmental scope and span of control.



But until now, a simple solution for these intermediate sites has not been readily available.

What's needed is a new kind of processor that can complement today's remote systems by filling the gap between the lowest level in the network and the central office. What's needed is a unique computer for large regional and district sites . . . optimized for distributed data base management and wideband multiline communications.

What's needed is the NP|80—the new Network Processor that distributes your data the way your company is organized.

NP|80—the missing link.

Four-Phase Systems' NP|80 is a new computer system that complements and extends the capabilities of our popular System IV/40 and System IV/70, field proven with over 70 million operator hours.

Designed for use at intermediate network locations, the NP|80 lets you distribute computing power and data files naturally throughout your organization while preserving compatibility with both current line disciplines and IBM SDLC protocol.

Up to 64 local displays can access an NP|80 data base of up to 270 million bytes through direct channel connection of two System IV/70's.

These same displays can also access your central data base at speeds up to 50K baud through the NP|80's wideband communications facilities.

While performing data base management and communications services for the local System IV/70's, the NP|80 can concurrently provide master multipoint control for an extensive network of remote Four-Phase systems with speeds up to 9600 baud.

Now each level of an organization can store frequently used data in local system files for interactive access. At the same time, operators can retrieve information stored at higher and lower levels throughout the organization.

As a result, system response patterns can be matched to local requirements through flexible application of total network resources.

Multilevel network access.

Multilevel distributed processing adds a new dimension to remote computing.

Displays at remote locations can access local, regional, and central files with automatic routing based on data availability. Typically, most transactions will be processed against local files while exception transmissions are passed to the next highest level.

Similarly at regional sites, transaction processing can be supported by both local and central files while down line communication is pipelined through the NP|80 with negligible CPU loading.

Central control with local autonomy.

Now line managers can assume responsibility for the data processing they require. Needed reports and documents are easily generated at remote locations using COBOL, RPG, Sort, Assembler, DOS, and an extensive selection of utilities. And programming can be done either locally or at headquarters.

For data base synchronization, branch and regional files can be updated from the central site. Detailed information in these files can also be accessed by headquarters when required.

Complete freedom exists to tailor networks exactly to your needs. Regional NP|80's can communicate with district NP|80's which in turn can communicate with branch System IV/40's and System IV/70's.

Through such multilevel processing, the NP|80 offers large network users enhanced system performance, increased functional capability, expanded display support, reduced mainframe loading, hierarchical fallback, and greater flexibility in meeting changing or expanding requirements.

Distributed data management.

NP|80 network control and data management services are provided by a resident multiprogramming executive. While transparent to system users, the NP|80 can concurrently support shared file access and high speed communications for separate application programs on two System IV/70's.

The NP|80 performs indexing, searching, and deblocking operations for the attached System IV/70's while handling communications concentration for the lower level systems. Blocks of up to 128 sectors may be read or written by the NP|80 with a disc transfer rate of 1.2M bytes/second.

The parts we needed didn't exist, so we had to make them ourselves.



Magnified view of Four-Phase's new 16K-bit n-channel silicon gate RAM.

In 1970 we introduced the industry's first computer with LSI semiconductor memory and an LSI central processing unit.

In 1972 we shipped the industry's first systems with 2K LSI RAM's.

Now with the NP|80, we've created another milestone—*the first computer to be introduced with 16K LSI RAM's.*

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256K bytes of network processing power.



This hand contains all the 16K-bit RAM chips needed for the NP|80's 256K byte memory with error correction.

The heart of the NP|80 is a powerful 16-bit computer with 500 ns cycle time and up to 256K bytes of LSI memory.

The system includes multiple DMA channels, software and hardware error recovery facilities, firmware diagnostics, a memory relocation and protection system, and communications control for up to six high speed lines.

To learn more about the NP|80 and our comprehensive selection of distributed processing software, send for our new brochure.

Four-Phase Systems

Four-Phase Systems, Inc., National Marketing Headquarters
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Name _____ Title _____

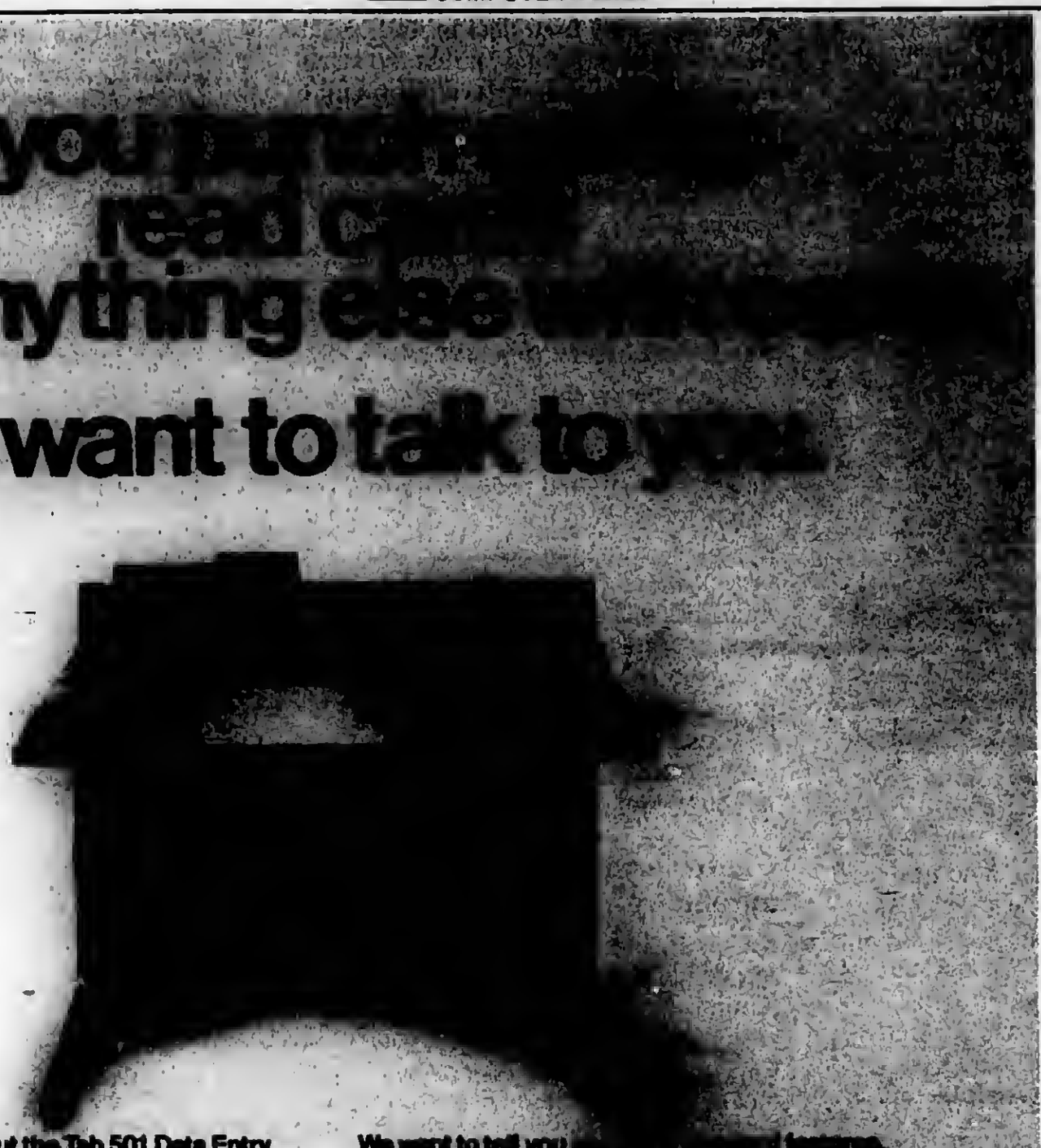
Company _____

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Telephone _____

City _____ State _____ Zip _____

If you [illegible] or do anything else [illegible] we want to talk to you.



We want to talk to you about the Tab 501 Data Entry Microprocessor.

About the unique versatility and operating capabilities resulting from its built-in microprocessor, RS-232C interface and unmatched performance characteristics:

- Minicomputer card input or output.
- Data transmission via modem or cable for terminal applications.
- Interfacing to virtually any type of data entry or processing system.
- On-line or off-line versatility.
- Reading, punching, printing, verifying and interpreting capabilities.
- Attractive purchase or lease plans.

We want to tell you [illegible] features.

- Constants from memory—up to 220 columns.
- Up to 28 program levels with automatic sequencing.
- Instant verification.
- Completely automatic error correction.
- High speed character duplication.
- Exceptionally quiet.
- Unparalleled operator acceptance of over 2,000 installed units.
- Easy to learn—easy to operate.

Let's talk about "specials". We want your specials. Special applications. Special operating characteristics. Special interfaces. Special keyboard requirements. Because the Tab 501 Data Entry Microprocessor has this unique flexibility, we can give you what you want—easily and inexpensively. It's worth talking about.

Gentlemen: Let's talk.
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Company_____
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City_____ State_____ Zip_____
Telephone_____

Let's talk:
☐ Interfaces. ☐ Special requirements.
☐ Terminal applications. ☐ Send more information.

TAB PRODUCTS CO
2000 Hanover Street
Palo Alto, California 94304

Graphics Systems Added by Adage

BOSTON – Adage, Inc. has announced two interactive refresh graphics computer systems.

The Adage GP/400 independent graphics peripheral incorporates a 200 nsec microprogrammed graphics processor that implements complete graphics language in firmware.

Processing of all graphics commands and sampling of all console devices is handled internally to the graphics peripheral with no demands on the host computer. Free of machine-dependent graphics software, the GP/400 can be used with any customer-specified host computer, Adage said.

The Adage GS/300 interactive computer graphics system is an integrated hardware/software system incorporating the same 200 nsec microprogrammed graphics processor as the GP/400 in addition to a general-purpose digital computer.

The GP/400 costs $45,000 and the GS/300 costs $107,000 from the firm at 1079 Commonwealth Ave., 02215.

Two Fiche Standards Get Ansi's Approval

SILVER SPRING, Md. – The National Micrographics Association (NMA) has announced acceptance of two micrographics standards and the availability of a micrographics reference book.

The American Standards Institute (Ansi) PH5.9-1975 standard replaces both Ansi PH5.9-1970 and NMA MS5-1972, the NMA said. It covers distribution microfiche of documents generally not exceeding 8-1/2 in. by 11 in.

The Ansi PH5.22-1975 standard covers dimensions and operational constraints for double-core cassettes for 16mm processed microfilm.

Reference Text

The reference text, *Micrographic Systems* by Daniel M. Costigan, was described as both a reference source for the micrographics specialist and an introduction to micrographics for the novice.

The two standards cost $3 for members and $4 for nonmembers. The reference text costs $12.50 for members and $16.50 for nonmembers from the NMA's Publication Sales Office at 8728 Colesville Road, 20910.

Communication Terminals for your Communication Needs.....and more!

DTC-300/S (pedestal) and 300/T (desk top)

Features include:
- Diablo printer with micro-processor controller
- Selectric style keyboard with numeric pad
- Addressable Horizontal and Vertical tabs
- Variable length forms control
- Plot capability with BASIC and Fortran routine available from DTC.

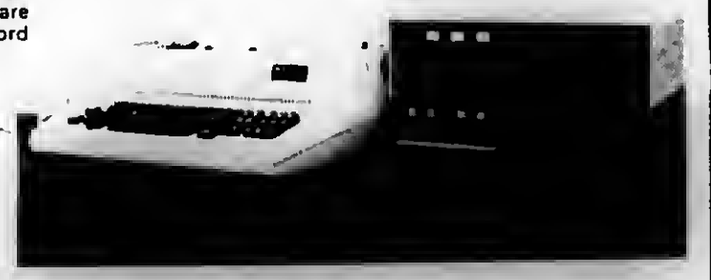
DTC HyWriter R.O. (either pedestal or desk top)

Features include:
- Diablo printer with micro-processor controller
- 110 - 2400 baud, serial or parallel interface.
- Same firmware features of 300/S and 300/T

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An *intelligent, user programmable*, flexible disc storage device that is interface compatible with any RS-232 type data terminal. Typical Micro-File applications are data entry, text and program generation, file/record maintenance, text processing, and more.

Features include:
- Dual Flexible disc drive (600K characters)
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- User progremmable in Intel PL/M language
- Basic Interpreter, Fortran Compilers aveilable
- Text Editor application program
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...has it. Why wait?



Now you can get the 3348, or "Winchester," Data Module, with all the quality and error-free performance that the name BASF implies . . . and at a competitive price.

The "Winchester" Data Module is a completely self-contained unit, incorporating heads, spindle, and recording surfaces in a protective factory-sealed pack. You've heard of the advantages of this new technology . . . complete security from environmental contamination, improved high-density storage, and incredibly fast access. Now you can enjoy this premium performance without paying a premium price.

Here are the facts, in brief: • Complete compatibility with 3340 drives • BASF-guaranteed Zero-Error performance • Now available in two configurations. . . . The 1335 Module, with 35 million-byte capacity, and the 1370 Module, with 70 million-byte capacity • Our 1370F Module, with fixed head and quicker access, will be available later.

For complete details on the BASF "Winchester" Data Module, write: BASF Systems, Crosby Drive, Bedford, MA 01730, or call our nearest regional office . . . in **Los Angeles,** (213) 451-8781; in **Chicago,** (312) 343-6618; and **Clifton, N.J.** (201) 473-8424.

You're already paying for BASF quality...you might as well have it.

"In the time it took to say 13 transactions, the PDP-11/70 did them."

David Kosko, Digital Test Programmer



It started last June with a report out of Cleveland. One of the customers said he ran close to 500 transactions a second doing analog inputs. Then another report came in. A New York bank set a record of 3.2 transactions per second doing multiple data base tasks. Across the country, more and more customers were amazed at the throughput power of the 11/70.

We weren't. Some time ago, we conducted a test of our own in the lab, based on a customer service application adapted from an actual situation. If we had hit 3 or 4, most people would have been amazed. What we got was 13 transactions per second, hour after hour. Our $200,000 computer performed like a million-dollar main frame.

The question: how could it happen? There are at least 5 reasons.

Reason 1. Total systems speed. The 11/70 is designed for speed both inside and out. Not just the processor, but the software, the cache memory, the I/O channels, the disks, the peripherals. In fact, the complete package is especially designed to run a lot of data. In a hurry.

Reason 2. Up to 2 million bytes of core memory. Attached to a 2k byte, 240 nanosecond bipolar cache. (Uniquely, the cache acts like a high speed buffer between the main memory and the CPU, and just as uniquely this results in an effective memory cycle of under 400 nanoseconds.)

Reason 3. The 11/70 uses high speed dedicated I/O busses. These busses can transfer data from a disk as fast as 1 megabyte per second. And the disks themselves can be expanded to give you up to 700 million bytes of storage on-line.

Reason 4. The 11/70 can be accessed by hundreds of terminals. What's more, you're not limited to just a few standard disks and terminals. Instead, you can choose from 60 different peripherals including a variety of line printers, tape drives, disk systems, and more. Much more.

Reason 5. Your choice of three operating systems. IAS lets you do batch, real-time, and time-sharing tasks—all at the same time. Or you can choose our dedicated operating systems, RSTS/E for timesharing. And RSX-11 for real-time. With languages to match. ANSI-74 COBOL, extended BASIC, MACRO assembler, FORTRAN IV.

The PDP-11/70 gives you a throughput breakthrough. At a breakthrough price. For more information, call your nearest Digital representative. Or write Digital Equipment Corporation, Maynard, Mass. 01754. European headquarters: 81 route de l'Aire, 1211 Geneva 26. Tel: 42 79 50. Digital Equipment of Canada, Ltd.

digital

50,000 computers saving managers millions.

13 Transactions/Second Defined. To show how the 11/70 handles data, we set up a real-life transaction processing application. We used standard 11/70 hardware. Standard RSTS/E software. And a standard commercially available data base stored across two disk packs. Then we wrote an applications program to allow 27 users to simultaneously query and update the file. The 11/70 responded at a record 13 transactions per second. With an average 2.6 disk accesses per transaction, including the read/write/verify sequences in file updates.

Digital Equipment Corporation, Communications Services
NRII/M15, Northboro, Mass. 01532

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Key-to-Disk Exceeds Small Site's Savings Expectations

IRVINE, Calif. – A dollar savings eight times greater than estimated and numerous intangible benefits have resulted from a switch to key-to-disk data entry equipment at the Aerospace Group headquarters here of Parker-Hannifin Corp.

The net savings after installation of an Inforex system was $375/mo compared with an estimated savings of $47/mo, according to Jim Sullivan, manager of management information services at the facility.

"Because this installation is considered small, with only four keypunch and verify devices and six operators on two shifts, economics became a major factor in justifying a change," Sullivan said.

Parker-Hannifin is a manufacturer of fluid systems and components for industrial, automotive and high-technology markets.

The greater savings at the Aerospace Group resulted from increased efficiency, greater production, reduced card consumption and reduced overtime labor costs, Sullivan explained. Equipment costs were slightly more, however.

The intangible benefits that came to the group after it installed an Inforex System 1301 with four keystations in January 1974 and returned its four Univac 1700 keypunches and verifiers include:

- Improved data entry keypunching production levels by about 25% to 30%.
- Improved accuracy in entering and verifying data.
- Improved computer operations efficiency.
- Improved data entry input format flexibility for application system design.
- An enhanced working environment for the data entry operators.
- Consolidation of data from remote sites, via communications lines, on a timely basis.

Additional benefits have accrued to the Irvine facility since the installation, Sullivan said, including ease in developing new application programs and use of data communications.

"One of the major intangible justifications was the development of a computer-assisted production and inventory control system," he noted. "The heart of this system is a bill of material for each product that we manufacture.

"We felt that if we were restricted to an 80-character input card, the redundancy of required fields would put serious limitations on our data entry function, as well as complicate the update program with numerous input formats.

"The key-to-disk equipment provides us with larger input records and, with the use of the reformat feature, we cut our estimated cost of data capture to 20% of original estimates," Sullivan said.

Sales Orders Gathered

The data communications function on the Inforex 1301 is used to gather sales orders from a plant in upstate New York and to transmit shipping data back to that plant, Sullivan explained.

The New York facility uses an intelligent terminal as a stand-alone data collection device for new sales orders and for shipping data during its normal business day, which is three hours different from the Irvine headquarters.

"We use a dial-up phone call daily to read out the New York plant's accumulated data, include it in our daily processing and then transmit shipping data back to it," he said.

Tangible savings – not including the monthly rental cost for keypunch equipment vs. Inforex key-to-disk equipment – come from reduced punched card costs and reduced labor costs, he explained.

Average card use prior to conversion to key-to-disk was 363,000 cards per month. Six months after installation, the card usage dropped to 122,000 cards, resulting in a savings of $248/mo. A savings of $206/mo had been estimated.

"A combination of overtime and part-time help was used to maintain keypunch production levels to minimize the data bottlenecks in the DP department," Sullivan said. "That required 100 man-hours per month for the three months prior to installation.

"Although overtime cannot be eliminated completely, it should remain in the 10- to 20 hours per month range," he said. In June 1974, overtime averaged 13 man-hours, resulting in a savings of $435/mo compared with an estimated $150/mo.

Production Increases

"The Inforex equipment provides us with a great deal of data on the operator's performance, as well as individual job characteristics," Sullivan said. "Such information was not obtained easily, if at all, from the standard keypunch machines.

"For instance, we have seen production levels improve by almost 50% between December 1973 and March 1974. This is measured in cards punched per keypunch hour.

"And we have seen the detected error rate – mistakes made by a keypuncher and caught during verification – fall to 1.23% in June from 4.75% in December."

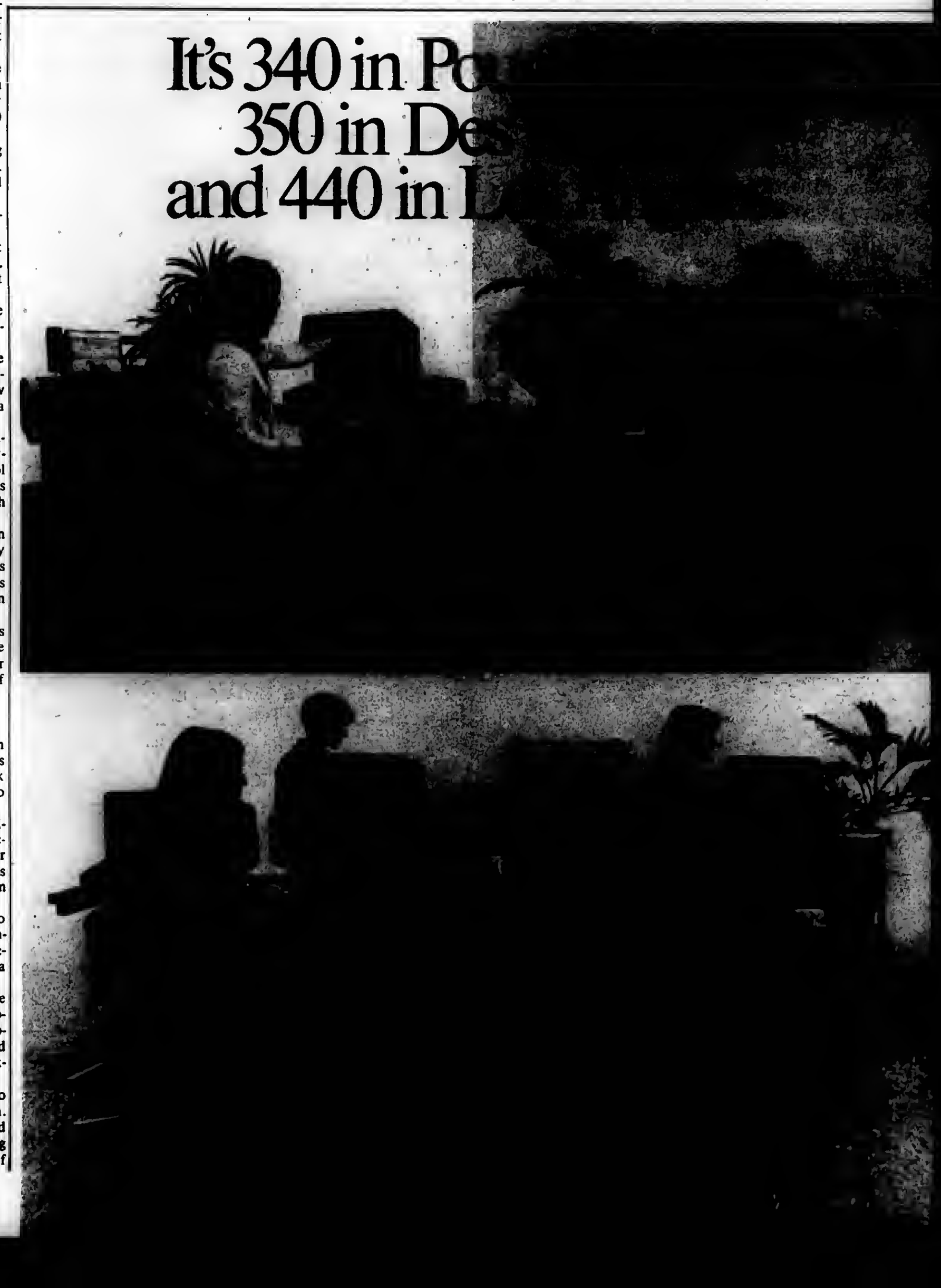
There are two ways to summarize increases and decreases in productivity at the Irvine facility: the monthly DP labor distribution report that shows all expenditures of department personnel time and runtimes for each job; and the logs for source documents submitted to keypunching and for data received in the computer room for processing.

To determine changes in man-hours per day productivity after installation of the Inforex data entry systems, Sullivan selected typical months before and after installation for the order processing, work-in-process and shop labor systems.

The order-processing production increased 56%, with man-hours per day dropping from 10 in October 1973 to 4.4 in March 1974. Work-in-process production increased 30%, with man-hours per day dropping from 6 in October to 4.2 in March. And shop labor production increased 38%, with expended man-hours dropping from 5.2 in October to 3.2 in March.

Delivered Sooner

A second measure of performance is the effect the conversion to key-to-disk data entry has on computer operations. Prior to installation of the Inforex system, work delivered to the keypunch department around 5 p.m. was processed and delivered to the computer room at 11:30 p.m. Now the same work is being delivered to the computer room three hours earlier, or at about 8:30 p.m.



360 Replaced by Univac 90/30

Hospital's Budget $1,500/Mo Less After CPU Switch

NEW ALBANY, Ind. – When Memorial Hospital, a 260-bed, nonprofit institution here, saw it could replace its 24K IBM 360/22 with a 32K Univac 90/30 for $1,500 less a month, it went ahead and did it for "strictly financial considerations," according to Shirley Michael, DP manager.

But the Univac system also offered a higher internal speed, more disk capacity and greater growth potential at the lower price, she added.

Installed in April, Memorial Hospital's 90/30 has two disk subsystems with a total storage capacity of 57.9M bytes, a card reader operating at the rate of 500 card/min, a card punch and a printer with a speed of 500 line/min.

The system has a processing speed of 600 nsec.

The conversion of all existing programs from the 360/20 to the 90/30 was accomplished with relatively no problems within two months, she said.

The RPG-II programs were recompiled for the 90/30 at a Univac office in nearby Louisville, Ky.

"During the changeover period, we received excellent cooperation from all departments of the hospital," Michael noted. "They allowed us to freeze all of our programs while we made the conversion.

"As a safeguard, we ran our patient billing and inventory control programs in parallel for two weeks until we were sure everything was proceeding satisfactorily.

"From our experience to date, we feel our switch to the 90/30 was a sound decision that has given us a number of important benefits.

"Perhaps most important is the fact that we are operating more economically than before with an average cost savings of $1,500/mo.

"Additionally, we can perform many more tasks in a lot less time than previously. We also have the growth capability to expand the system if required by merely adding more memory or peripherals without the need to replace the entire system."

Keeps Tabs on Expenses

Keeping close tabs on expenses in all departments is a major chore for Luther Wyrick, the hospital's associate administrator. He views the hospital's computer as a valuable asset in his work.

"We couldn't run a hospital this size today without computer assistance," Wyrick noted.

"Over the last few years the volume of paperwork we have to process has multiplied enormously. I hate to think how we could cope with it manually.

"We're also receiving a considerable amount of management information from the system that would be almost impossible to obtain manually except at exorbitant cost.

"From this data we can spot trends much earlier in such areas as labor distribution and departmental overspending and take appropriate action before it becomes a severe problem."

Three Billing Files

One of the computer's major tasks is handling the hospital's billing operation, always a sizable task for any hospital forced to cope with today's proliferation of insurance forms.

Three data files – one each for patient census, charges and insurance and kept in the same disk pack – are used to accomplish this operation.

Each time a patient is admitted, an admissions slip is received by the DP department from the admittance office. From this information, a new patient or census card is keypunched and a master record produced for the patient data files.

The census card indicates the patient's name, birthday; date of admission and, later, the date of dismissal. It also lists station, room and bed number, physician's name, accommodation code (semi-private room or ward) and type of service (medical or surgical).

Insurance coding forms are also received from the admittance office. These trigger preparation of a second card known as a guarantor's card, which is keypunched and the information entered into the patient's record.

A final census report generates charges for rooms and other miscellaneous charges such as telephone calls and birth certificates. This information then becomes the input for the billing operation.

A record of purchase orders issued by the hospital's purchasing agent is kept in the computer's files. When the merchandise arrives another card is punched and the inventory records updated.

As supplies are released from the stores to the department needing them, inventory records are again updated and the departments receiving the supplies have their accounts charged against their budget allocation.

At the end of each month, a statement of the purchase orders paid is sent to the DP department by the hospital's business office listing the amounts paid to vendors.

A weekly stock status report is prepared which details the amount of medical/surgical, X-ray, laboratory and dietary supplies on hand, how much was ordered during the week, how much was received during the week and how much was issued to departments.

Another report is prepared weekly on open purchase orders as a reminder to the purchasing agent to "chase up" the vendors concerned.

The computer generates automated purchase orders for supplies used frequently and these are sent to the purchasing agent for his signature.

The purchasing agent receives a report at the end of the month of items paid for as well as an item distribution run showing items dispensed to different departments.

On a monthly basis, an item distribution is run for each of the hospital's 16 departments showing the total number of items and the amount of money charged to each unit. A recapitulation of these charges is supplied to the business office.

Now there's a family of distributed data entry and processing systems that you can tailor to the requirements of your remote sites.

If you've considered the advantages of distributed data entry and processing, you've probably discovered a sad truth:

A system that's fine for Poughkeepsie might be a washout in DesMoines.

Different sites have different needs. From remote data entry, to communications, to remote inquiry and response, to on-site report and forms generation.

And to overwhelm a small branch with high-powered equipment is just as bad as under-equipping a large one.

To match each of your branches with exactly the right equipment, in both hardware and software, there's only one terminal manufacturer to turn to. Us.

We're as flexible as you are.

Using our Sycor Models 340, 350 and 440, and their wide range of peripheral equipment, you can pinpoint capability to site requirements and price.

Our Model 350, for instance, might be just the ticket for your two-man operation in Des Moines. While a larger branch in Los Angeles might require the concurrent background processing capabilities of the Sycor 440.

And, while each of the three terminal systems has its own unique capabilities, they all work together in a remote processing network.

Each, for example, can be programmed with our high-level, easy-to-use TAL language. And, they not only talk to your CPU, but to each other.

And that means flexibility.

Should the requirements of one location change, our systems can change with them. You can switch terminal models without changing programs, or even retraining operators.

The Model 340.

For smaller office situations that call for data entry, you'll find our Model 340 the low-cost intelligent answer.

No matter which of its hundreds of applications you use it for—like order entry, payroll and accounts payable—you're assured of virtually error-free data every time. Because operator errors are pointed out immediately for on-the-spot correction.

And, its 8k bytes of programmable memory and capabilities like customized field validation, conditional data entry and arithmetic operations, mean the Model 340 goes even further in providing for needs you might not even have anticipated when you first got it.

The Model 350.

If you need the advantages of random accessibility, look into the Model 350. The 500,000 "fill-in-the-blanks" characters on its exclusive dual flexible disks let you store customer, product/price and salesman files right at the source.

And, with its 16k bytes of programmable memory, the Model 350 not only retrieves data, but maintains and updates files—and even generates reports.

Just key in a customer number and you get all the pertinent data: name, address and billing information. That means reduced keystrokes, improved accuracy and big savings.

The Sycor 440 System.

When you need more than just data entry, look into our new Sycor 440. With a disk storage capacity of up to 10 million characters and the use of up to eight separate terminals, you can do data entry and inquiry/response concurrent with background processing.

Our 440 system lets you share and access files locally, reducing communication line costs and investments in central CPU resources.

Each display is controlled by the on-site processor and is capable of performing independently. At the same time that you're performing data entry you can make use of our special programs to produce a wide variety of management reports like sales analysis, inventory and billing.

It's a system as flexible as your needs.

Give us a call.

We invite you to take a closer look at our family of distributed data entry and processing systems —the lowest cost answer to your branch office needs.

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New

DATA 100 model 77

powerful, intelligent remote data entry and batch communications . . . for only $328/month*



The Model 77 is an intelligent [illegible] unit which permits the user to enter, store and transmit data under the control of powerful data entry and communications software.

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Look for more elements of distributed processing systems from DATA 100 throughout 1976

DATA 100 CORPORATION



Operators check control-room instruments at Georgia Pacific Corp.'s PVC plant in Plaquemine, La.

In Plastics Plants

Minis Reduce Risks to Workers

SAN LEANDRO, Calif. – Minicomputers are now being used to help reduce risks to employees in the process of making polyvinyl chloride (PVC), a plastic widely used in pipe, pipe fittings and packaging.

Varian Data Machines Series 620 minicomputers are controlling chemical reactors at three large new plants that manufacture PVC.

The three plants are operated by Georgia Pacific Corp in Plaquemine, La.; Shintech, Inc. in Freeport, Texas; and Tenneco Chemicals, Inc. in Pasadena, Texas.

Together, these plants account for 25% of present domestic PVC capacity. All of them were started during the past nine months.

All were designed specifically for computer control – a strategy that offers increases of 30% to 40% in throughput per unit of capital cost when compared with manual control.

And all of them can meet the Occupational Safety and Health Administration's (Osha) new limits on the exposure of workers to vinyl chloride monomer (VCM), the major raw material used in making PVC.

To date, no manually controlled PVC plant has been able to comply with Osha's requirements.

The design and implementation of computer control at the three plants was handled by the Taylor Instrument Process Control Division of Sybron Corp. in Rochester, N.Y.

J. Patrick Kennedy, a systems consultant at Taylor's office here, said the manufacture of PVC provides an excellent example of the advantages computer control can bring to a batch process: increased throughput; closer control of the process; major gains in safety; and, often, the opportunity to use larger, more efficient processing equipment.

PVC is made by the polymerization of VCM. In this reaction, molecules of VCM join to form long, chain-like molecules – polymers – of PVC.

In a typical manufacturing cycle, a reactor is loaded with VCM, water, a catalyst and certain additives. The vessel then is heated with steam until the polymerization – which produces considerable heat – is running at a selected temperature.

After that, the reactor must be cooled with water until the polymerization is finished.

Then the reactor is cooled down, unreacted VCM is vented to a recovery unit and the PVC product is removed for drying and storage.

This polymerization process is extremely sensitive to temperature. There are several grades of PVC plastic, and very small temperature differences determine which type is produced.

Cycle Time Cut

Under manual control, a polymerization cycle might take about 14 hours. Computer control can cut this time to about eight hours, Kennedy said. It does this by several means.

First, it takes dead time out of the process by making certain that the reactor and its associated equipment are never standing idle, waiting for an operator to do something. Secondly, it both optimizes and hastens the heat-up and cool-down phases of the process. Thirdly, it allows

(Continued on Page 40)

User Places Blame on Systems House For Problems With Nova Installation

By Mal Stiefel
Special to Computerworld

TULSA, Okla. – Wholesaler J.C. Hamilton Co. has gotten little but grief from its $70,000 investment and its two-year struggle to wring some benefit from its in-house Data General Corp. Nova 1200 system, according to company president J.C. Hamilton Jr.

He placed the blame not with the hardware, but with the systems house that put the installation together.

The hardware and software supplier, Computer Sales and Service, went bankrupt and its owner moved to Dallas, leaving the firm and another company in the Tulsa area with undocumented programs written in a "unique language" that couldn't be understood by any outside programmer or by the users themselves, Hamilton said.

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By John Hebert
Of the CW Staff

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The crime occurred between the hours of 10 p.m., when the building was locked for the night, and 8 a.m., when the loss was discovered, Falkman said.

But the $10,000 to $20,000 worth of equipment was probably taken before 1 a.m. – the time when Martin Security makes its rounds, he said.

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The thief or thieves "seemed to know what they were doing," because the electrical cables were cut in such a way as to leave a lot of wire attached to the equipment, he said.

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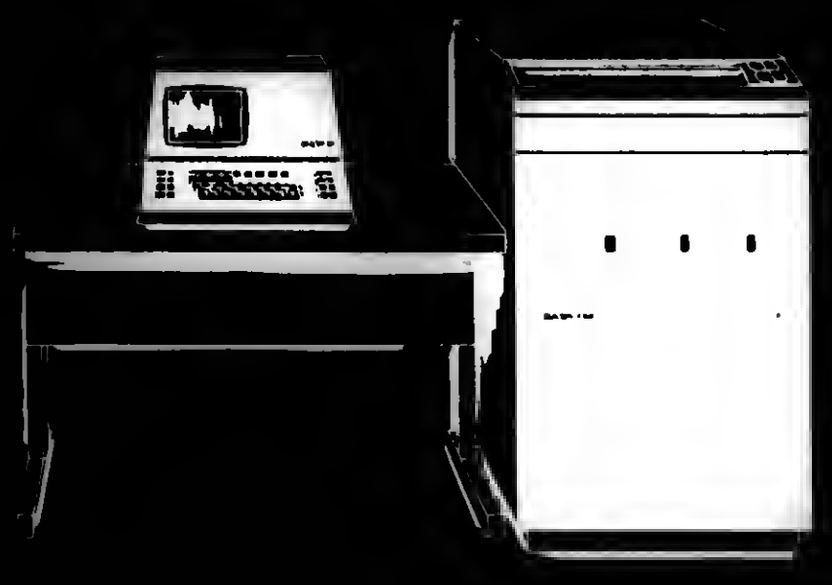
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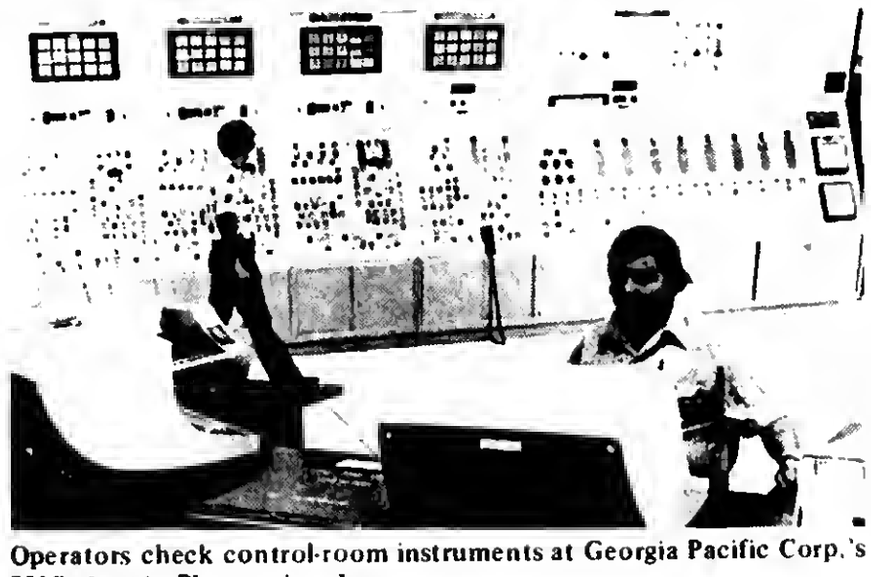
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Operators check control-room instruments at Georgia Pacific Corp.'s PVC plant in Plaquemine, La.

In Plastics Plants

Minis Reduce Risks to Workers

SAN LEANDRO, Calif. – Minicomputers are now being used to help reduce risks to employees in the process of making polyvinyl chloride (PVC), a plastic widely used in pipe, pipe fittings and packaging.

Varian Data Machines Series 620 minicomputers are controlling chemical reactors at three large new plants that manufacture PVC.

The three plants are operated by Georgia Pacific Corp in Plaquemine, La.; Shintech, Inc. in Freeport, Texas; and Tenneco Chemicals, Inc in Pasadena, Texas.

Together, these plants account for 25% of present domestic PVC capacity. All of them were started during the past nine months.

All were designed specifically for computer control a strategy that offers increases of 30% to 40% in throughput per unit of capital cost when compared with manual control.

And all of them can meet the Occupational Safety and Health Administration's (Osha) new limits on the exposure of workers to vinyl chloride monomer (VCM), the major raw material used in making PVC.

To date, no manually controlled PVC plant has been able to comply with Osha's requirements.

The design and implementation of computer control at the three plants was handled by the Taylor Instrument Process Control Division of Sybron Corp in Rochester, N.Y.

J. Patrick Kennedy, a systems consultant at Taylor's office here, said the manufacture of PVC provides an excellent example of the advantages computer control can bring to a batch process increased throughput, closer control of the process, major gains in safety; and, often, the opportunity to use larger, more efficient processing equipment.

PVC is made by the polymerization of VCM. In this reaction, molecules of VCM join to form long, chain-like molecules polymers of PVC.

In a typical manufacturing cycle, a reactor is loaded with VCM, water, a catalyst and certain additives. The vessel then is heated with steam until the polymerization which produces considerable heat is running at a selected temperature.

After that, the reactor must be cooled with water until the polymerization is finished.

Then the reactor is cooled down, unreacted VCM is vented to a recovery unit and the PVC product is removed for drying and storage.

This polymerization process is extremely sensitive to temperature. There are several grades of PVC plastic, and very small temperature differences determine which type is produced.

Cycle Time Cut

Under manual control, a polymerization cycle might take about 14 hours. Computer control can cut this time to about eight hours, Kennedy said. It does this by several means.

First, it takes dead time out of the process by making certain that the reactor and its associated equipment are never standing idle, waiting for an operator to do something. Secondly, it both optimizes and hastens the heat-up and cool-down phases of the process. Thirdly, it allows

(Continued on Page 40)

User Places Blame on Systems House For Problems With Nova Installation

By Mal Stiefel
Special to Computerworld

TULSA, Okla. Wholesaler J.C. Hamilton Co. has gotten little but grief from its $70,000 investment and its two-year struggle to wring some benefit from its in-house Data General Corp. Nova 1200 system, according to company president J.C. Hamilton Jr.

He placed the blame not with the hardware, but with the systems house that put the installation together.

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Minis Help Reduce Worker Risks in Plastics Plants

(Continued from Page 39)
simultaneous performance of steps that must be done serially in a manually controlled plant.

The charging of a PVC reactor involves a large number of steps and the operation of as many as 50 valves and other devices – notably the opening and closing of valves, Kennedy said.

When a few seconds are trimmed from the operation of each device and when sequential make-ready steps that take an hour are replaced by a computer-controlled operation that takes a few minutes, the saving of time can be substantial.

This can be translated readily into dollars. Kennedy cited an example of a plant that makes 400,000 ton/year of PVC, buying the required VCM for 12 cent/lb and selling the plastic for 26 cent/lb.

If such a plant had a cycle time of 14 hours under manual control, every minute trimmed from the cycle time would yield about $125,000/year in increased revenues simply by boosting throughput.

Contributes to Safety

The computer system's ability to check and compare information contributes greatly to the safety of both the product and the plant's operating personnel.

Manually controlled reactors have suffered a variety of accidents: additives have been omitted, so that batches were ruined; valves have opened prematurely, dumping the product; and reactors have exploded after receiving a double charge of catalyst.

In a computer-controlled plant, a large number of data checks virtually precludes such occurrences, Kennedy said.

For example, when a reactor is being charged, the computer in a Taylor PVC system determines how much reactant has flowed by monitoring four quantities: revolutions of a flow meter, revolutions of the pump that delivers the reactant, total running time of the pump and the change in the liquid level in the reactant tank.

Unless all of these quantities agree, the computer initiates an emergency procedure requiring intervention by an operator.

The value of computer control in allowing advanced processing equipment to be used is illustrated by the recent advent of large reactors in PVC manufacture.

The reactors stand about six stories tall and hold 30,000 to 50,000 gallons. In manually controlled plants, each reactor's capacity is between 2,000 and 7,000 gallons.

Able to Meet Standards

This combination of computer control and large reactor size – along with new methods of fabricating, coating and cleaning the reactors – will enable the owners of automated PVC plants to meet new Osha standards that will limit the exposure of workers to VCM vapors.

The regulations require that the average level of VCM in the air a worker breathes during an eight-hour shift must not exceed one part per million and that peak levels of VCM must not exceed five parts per million.

Plant operators are exposed to VCM from two sources. Valves and fittings may allow small amounts of monomer to leak continuously into the plant atmosphere. And larger amounts of vapor may be released when a reactor is opened for manual cleaning.

In older PVC plants, average monomer concentrations in the ambient air may be as high as 50 parts per million, and local concentrations during reactor cleaning can be much greater.

Owners of such plants doubt that they can meet the Osha requirements, which are scheduled to become effective on April 1. The Society of the Plastics Industry tried unsuccessfully to persuade the Supreme Court to extend the deadline.

In the new large reactor plants, VCM vapor is well controlled, Kennedy said. There are fewer sources of leakage, since far less plumbing is needed for one 40,000-gallon reactor than for ten 4,000-gallon units.

And the large vessels are opened for cleaning less often. Reactors developed by Shen-etsu Chemical Industry Co. may need manual cleaning only once a year, he said.

This low cleaning frequency is attained through the use of a proprietary coating that is sprayed onto the reactor's interior surfaces before each processing run.

Equally important is the fact that an automated plant has fewer workers to expose to VCM, Kennedy said.

Shintech's plant, for example, has only about 45 operators. An older plant having roughly the same PVC capacity requires more than 160 operators.

The capital cost of such a system is about $250,000, corresponding to a leasing cost of about $8/hour for 24 hour/day, Kennedy said.

This is about half the cost of one plant operator, he said. Taking all overhead items and fringe benefits into account, a typical chemical-plant operator now costs his employer about $17/hour, Kennedy added.

THIS IS A
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Controls Measuring Devices

Mini System Hastens Lab Testing of Air Conditioners

YORK, Pa. – By controlling some of its numerous analog measuring devices with a minicomputer system, the York Division of Borg-Warner Corp. here has slashed the time required to acquire and process certain kinds of test data in its engineering laboratory.

The manufacturer of air-conditioning, refrigeration and heating and ventilating systems has also realized substantial savings in computer programming time and broadened its computerized testing applications.

The minicomputers include a Hewlett-Packard (HP) 9600 scientific measurement and control system, used for data acquisition and conversion, and an HP 3000 Mini Datacenter, used for component and system design, rating, test data analysis, mathematical/statistical analysis and program development.

Prior to installing the HP computers, all measurements of data crucial to air-conditioning research were read manually by technicians, then converted to punched cards for computer input.

Now the HP 9600, located in York's engineering test laboratory, has the capability of scanning up to 400 analog input channels from a variety of transducers. In addition, it converts the signals to a digital format for processing in the HP 3000 for some testing requirements.

Besides relieving technicians of manual data logging, the HP system processes in 1.07 hours a typical mix of test data that formerly required eight hours with the predecessor computer.

Programming man-hours with the HP 3000 have been reduced by 16%, according to the firm. Factors contributing to this improvement are on-line terminal access for program compilation and execution; a shareable subprogram library of commonly used subroutines; and HP software aids which facilitate the detection of program errors.

Data acquisition, conversion – from analog microvolt representations to digital degrees Fahrenheit, for example – and preliminary reduction are accomplished with the 9600. The HP 3000 is used for programming and further data processing. The two computers are interfaced to allow on-line transfer of programs and data.

Many variables are inherent in the basic air-conditioning cycle. Liquid refrigerant, the medium of air conditioning, flows to evaporator coils where it absorbs heat from air blown over the coils.

As a result, the refrigerant expands to a gaseous state. The vapors must then be compressed sufficiently to gain a high enough saturation pressure to allow condensing at an above-ambient temperature.

Upon discharge into a condenser, the heat is passed from the vapor to the atmosphere, thus condensing the vapor into a liquid state. Supporting the cycle are various flow controls and valves to regulate the process on demand from the air being conditioned.

A system of one variable in the design of an air-conditioning system affects the others. Hence, comprehensive testing is essential at York to increase continually the efficiency of its products.

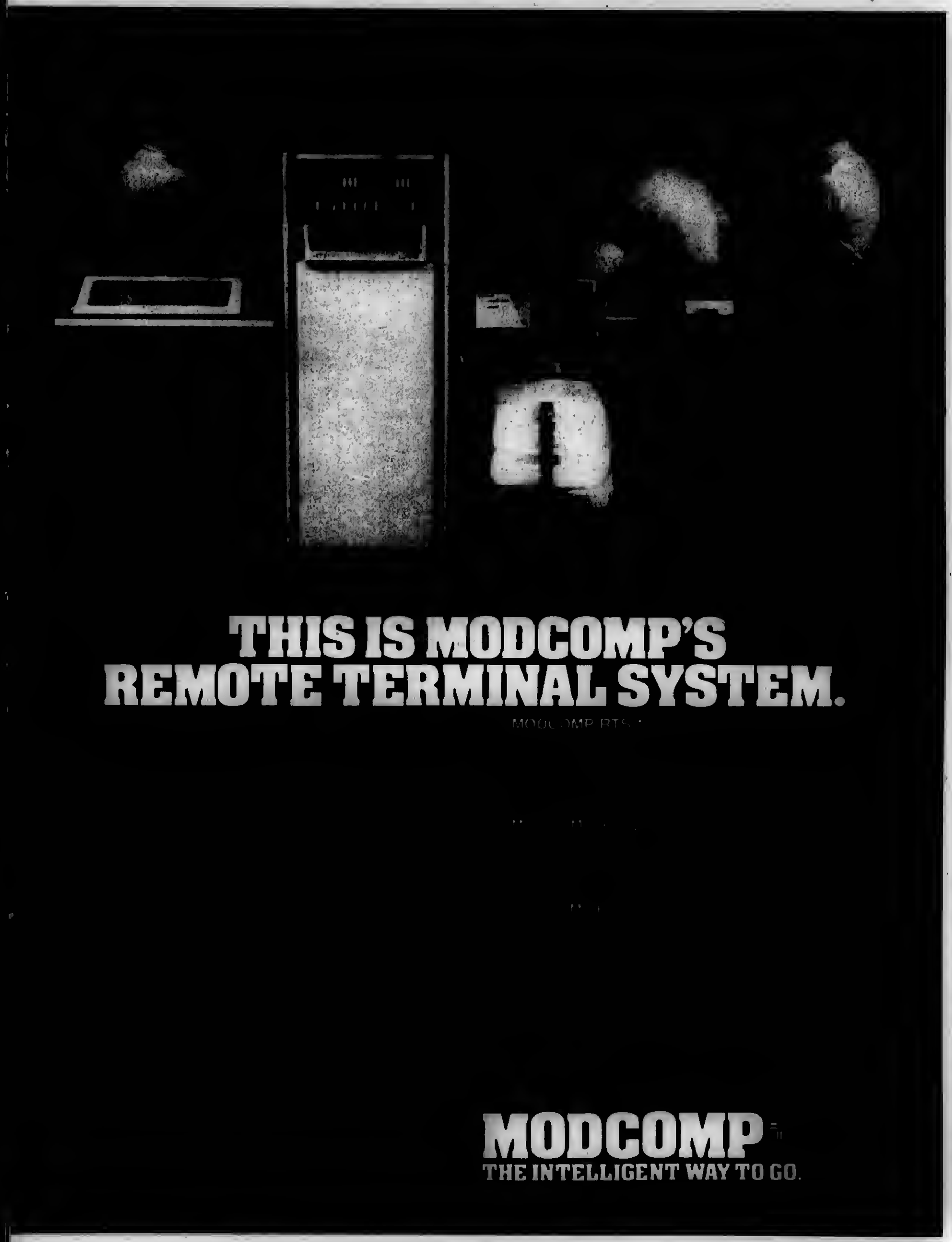
Checks Temperatures

The program entails measuring temperatures, pressures, flow rates, electrical power and acoustic spectra of operating air-conditioning systems.

One testing procedure, for example, measures various temperature levels both outside (at the condenser coil) and inside (at the evaporator coil), plus air flows and power input.

Other critical tests involve components. For example, a compressor, which compresses vapors received from the evaporator, must be tested for capacity and power usage under a wide range of conditions.

In addition to measuring and checking the refrigerant flow rate from electrical heat input to the stand and from water flow and temperature measurements, temperature and pressure are recorded for both compressor inlet and outlet, as well as compressor speed and power consumed.



AUSTRALIA

Authentic information is freely available **WITHOUT CHARGE** from the Australian Embassy in Washington, D.C. (202) 797-3000, and the Australian Consulate General in New York (212) 245-4000, San Francisco (415) 362-6160, Los Angeles (213) 380-4610 and Chicago (312) 329-1740.

Supports Infant Cardiac Net

T/S System at Hospital Improves Patient Support

FRAMINGHAM, Mass. – More and more, hospitals are looking at computer information systems as a means of fighting increases in costs and labor and continuing high-quality medical care.

The research computer facility at Boston Children's Hospital, a long-time computer user, reassessed its information processing needs a year ago. As a result, it modified its computer operations with a minicomputer time-sharing system.

The system, according to Jon Wadleigh, Boston Children's systems manager, has already increased the computing services available at the hospital, drastically improved data base updating and retrieval times and decreased the data storage needs of dedicated minicomputers scattered throughout the hospital's research facilities.

The system is composed of a Prime Computer Model 300 with 74K bytes of MOS main memory, a disk operating system with virtual memory, floating-point hardware and a 16-line asynchronous controller. It supports a card reader, 300 line/min printer, 60M-byte moving-head disk, 9-track magnetic tape unit and four CRT terminals.

Net for Infants

The Prime 300 provides time-sharing services for a variety of hospital applications, including the Regional Infant Cardiac Program (RICP), which involves Children's and 10 other hospitals.

The RICP, a unique hospital network covering all New England states, is concerned with collecting, storing and retrieving information on infants in the six-state region who develop congenital heart diseases.

The system at Children's Hospital acts as the information center for all hospitals in the program. The data base consists of 2,800 cases, or 95% of all children born with heart disease in the New England area over the past eight years.

The data base can be accessed in a variety of ways, such as by particular heart lesions, type of effective treatment, including surgical procedures, and life expectancy rates. The diversified data retrieval methods have allowed researchers to compile statistical analyses on particular types of heart disease, correlate any common data among cases that may show a causative relationship and study a particular set of cases with common attributes.

The system handles sorts, printing, update functions and data entry. The 300's time-sharing capability has resulted in making the program more of an on-line, interactive function, Wadleigh said, and has increased response to retrieval requests from days to a few hours.

The results of the program have saved the lives of an estimated 1,000 New England babies born over the last four years and improved the survival rate from 25% to 65% for the group as a whole.

Cardiology Data Base

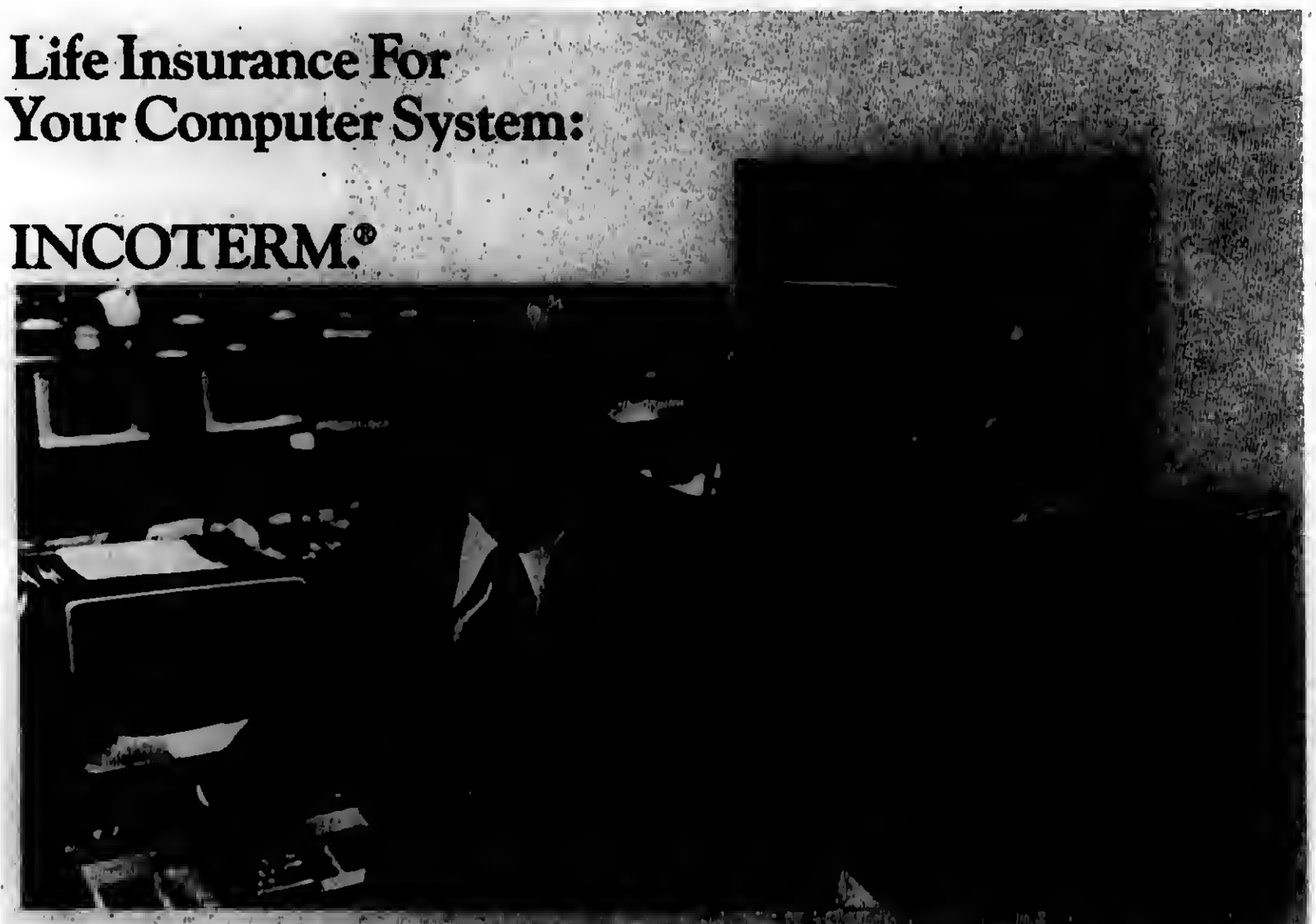
Computer information processing at Children's also extends to all cardiology patients seen at the hospital, plus a variety of independent research activities. The data base for cardiology patients numbers over 12,000 cases.

Data on each patient is inputted to the system by summary forms which are completed by hospital personnel in the clinic, catheterization lab, cardiology operating room and the pathology lab. This information is then encoded and processed.

Individual patient readouts supply doctors with comprehensive information about a patient, including history, diagnosis, procedures used, progress, associated surgery and a chronological list of medical events. These give doctors the most complete and current information available on which to base a diagnosis or prescribe treatment.

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Oklahoma City, Omaha, [illegible]
Pittsburgh, Portland, [illegible]

Mini-Controlled Signs Even Show Replays

By Ross W. Miller
Special to Computerworld

SPOKANE, Wash. – Want the time? Temperature? Game score?

Well, check your nearest automated display. Solid-state display systems by American Sign and Indicator Corp. (AS&I), located here, reach 120 million people every day with time, temperature, advertising and community messages – and many of these are minicomputer-controlled.

AS&I is the company that produced the 1,100-lightbulb message center at the American Stock Exchange and the automated reader board at Disneyland which, among other things, is capable of displaying Donald Duck, Pluto and other Disney characters.

An example of what AS&I can do is the $1 million 20-ft by 180-ft scoreboard at Riverfront Stadium in Cincinnati. The board, with 30,000 lamps and 405 miles of electric wire controlled by a minicomputer, displays statistics, game-in-progress information, pictures, shapes, words, cartoons and silhouettes synchronized to music.

The company also produced the scoreboards at Cobo Hall/Arena in Detroit, Mich., and Kansas City Hockey Scouts in Kansas City, Mo., as well as the dual scoreboard at the University of South Carolina. All three installations have full pictorial and logo capability and each is controlled by a Digital Equipment Corp. PDP-8.

Last summer, AS&I's most sophisticated scoreboard was installed at Pontiac Stadium in Michigan. Connected to two DEC PDP-11/35 minicomputers and a live video input, the scoreboard is capable of showing instant replays to the stadium crowd.

Applying the latest technology, a video signal is translated into digital format and relayed to the two minicomputers. The minis, in turn, by transmitting 4 bit/point to the board's 10,800 gas-filled, 40-watt lightbulbs, produce a 16-level grey scale on a matrix so fine the effect is that of a giant television picture.



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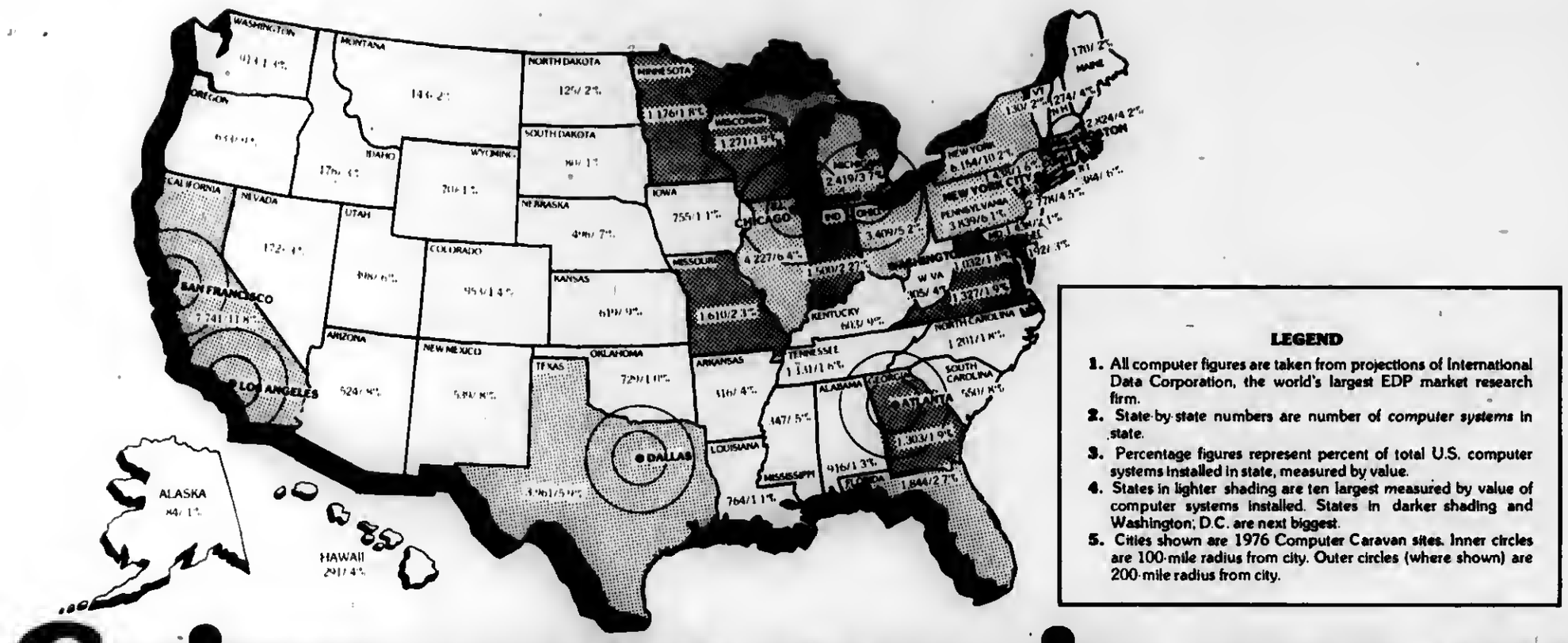
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LEGEND

1. All computer figures are taken from projections of International Data Corporation, the world's largest EDP market research firm.
2. State-by-state numbers are number of *computer systems* in state.
3. Percentage figures represent percent of total U.S. computer systems installed in state, measured by value.
4. States in lighter shading are ten largest measured by value of computer systems installed. States in darker shading and Washington, D.C. are next biggest.
5. Cities shown are 1976 Computer Caravan sites. Inner circles are 100-mile radius from city. Outer circles (where shown) are 200-mile radius from city.

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COMPUTER INDUSTRY

CI Notes

HIS, CII Talks Continue

PARIS – Negotiations are continuing on the contract for the merger of Honeywell-Bull and Compagnie Internationale pour l'Informatique (CII), a Honeywell Information Systems (HIS) spokesman said.

The French government is expected to grant contracts and subsidies valued at about $1.35 billion over the next four years, he said.

The French government has agreed to cover CII's losses for this year and for the first two months of next year, estimated at $175 million.

The spokesman explained the current negotiations are being conducted by lawyers, which could indicate agreement by high-level management has been reached on most terms.

DCC Injunction Stayed

FAIRFIELD, N.J. – Digital Computer Controls, Inc. (DCC) has filed an appeal and posted bond of $500,000, thus effecting a stay on the injunction handed down by the Delaware Chancery Court [CW, Nov. 19].

The appeal will be heard by the Supreme Court of Delaware.

DCC said it will continue to manufacture and ship its full product line, including the D-116 involved in the suit, pending a decision on the appeal.

The injunction barred DCC from copying and using Data General Corp.'s (DG) proprietary trade secrets contained in the logic design for DG's Nova 1200s for any purpose other than maintenance or as permitted by DG proprietary legends and from using DG's Nova 1200 and DCC D-116 logic drawings containing DG trade secrets for the purpose of manufacturing minis substantially identical to the Nova 1200.

Supershorts

Advanced Computer Techniques Corp. and Ekonomski Biro, a Yugoslav management and business consulting firm, have agreed in principle to establish a joint company to provide DP consulting services to companies in Yugoslavia and other countries.

– – –

Sirvess, Inc. has agreed to perform third-party maintenance on Data Printer Corp. line printers.

– – –

Computer Sciences Corp. has formed an Applied Technology Division in its systems group which will incorporate functions of the Field Services Division while adding more capabilities for engineering and operating simulation, aerospace and other high-technology systems for clients in industry and the Federal government.

As Batch Jobs Decline

Survey Finds Remote Batch, T/S to Grow

By Molly Upton
Of the CW Staff

NEW YORK – DP services firms of all sizes expect remote batch and time-sharing services to account for a larger percentage of their revenues in 1977 than in 1974 and expect batch to be a relatively less important source of revenues.

These are some of the results of the "Ninth Annual Industry Report" to the Association of Data Processing Service Organizations (Adapso) prepared by Quantum Science Corp.

The report analyzes responses from 130 firms in the computer services industry.

Smaller firms' profits held up relatively better than did those of the larger services firms during 1974 compared with 1973, the study indicated.

The most significant problem was the impact from service bureau competitors and/or new technology, followed by design and development of a new product, the Adapso report found.

Forecasting sources of revenues for 1977, the small firms, under $500,000 in annual revenues, indicated total revenues from batch would drop from 79% to 55% in 1974.

Firms in the category of $500,000 to $2 million in revenues foresee batch revenues dropping from 51% to 35% of their gross in 1977.

Firms from $2 million to $10 million see batch revenues accounting for 16% of their total in 1974, instead of the 24% in 1977, while for companies over $10 million, the drop will be from 18% to 15%, according to the study.

Remote batch and time-sharing services will show the largest gains among the smaller firms, rising from 6% to 20% in the smallest size firms and 15% to 27% in those with revenues between $500,000 and $2 million.

In firms between $2 million and $10 million, the increase in revenues from remote batch and time sharing will be from 21% to 28% in 1977, and for the largest firms from 18% to 24%.

Services Estimates Vary

Expectancy of revenue contributions from software services varies according to the size of the respondents. For instance, the smallest firms plan an increase in revenues from software services from 4% to 7%, while all other categories see a decrease in the percentage of total revenues.

Software products revenues are seen increasing by the $500,000 to $2 million firms and static by those over $10 million, while the rest forecast a decline.

Looking at profitability, the survey found the small firms' profits increased 112% between 1973 and 1974, while those in the $500,000 to $2 million category showed a rise of 4%.

However, in all other categories, the average profit declined.

Among firms in the $2 million to $10 million range, the average change was a 10% decline, compared with a 16% decline among those in the $10 million to $100 million category.

The average change overall among the 44 respondents to this question was a drop of 13%.

In ranking the competition, the category of other DP service firms retained its 1974 survey rank of first; however, minicomputers and small business systems, added to the questionnaire this year, soared to the No. 2 position.

Banks held third position as before. Corporations with in-house computers dropped to fourth position from the previous rank of second.

Government agencies outranked "others" for fifth place. Last year government agencies were last among possible competitors.

In ranking the most significant problems, companies differed in their assessment of the impact according to their sizes.

For instance, overall No. 1 was impact from service bureau competitors and/or new technology, as voted by the two smaller categories. However, the next to largest firms saw design and development of a new product as most significant, whereas the largest firms were primarily concerned with technical personnel acquisition and retention.

Overall, the second problem was design and development of a new product, followed by marketing personnel acquisition and retention, then technical personnel.

Ranking No. 5 was working capital and control of cash flow, followed by marketing of a new product, government regula-

(Continued on Page 46)

Add-On Business Turns Up Again With FS Delay, Uneasy Economy

By Molly Upton
Of the CW Staff

The 370 add-on memory business has improved over a year ago with a noticeable upward trend in the last six months, most makers contacted in a survey agreed.

And there's a lot of life in the 360 add-on market, they said.

In the 370 area, many attributed much of the growth to the word from IBM that it is postponing announcement of what was known as its Future Systems (FS) series.

Also, some cited the recessionary economy, which they said has prompted users to make do with their existing hardware rather than upgrade.

Bill Jordan, vice-president and general manager of Intel Corp.'s Memory Systems Division, said "business has been real good for us in the last six months."

Part of the rise in sales is a result of Intel's efforts to sell directly to the end user, he said, which began last spring.

Intel's add-on memory business is "substantially better than a year ago," he said, observing there has been a general increase throughout the year.

The 370 models for which add-on memory demand is currently greatest are the 135 and the 158, he said. The 158 add-on averages about 1M byte and the 135 about 250K bytes, he said.

Intel makes add-ons for the 135, 145 and 158 and will soon have one for the 168, he said. All products are semiconductor.

Jordan mentioned the recession as also partly responsible for the upswing, noting that in the economic crunch users tend to look to the independents.

Wayne R. Brumm, product manager of systems equipment operations at EMM Computer Products, said, "We're very bullish on 370 add-ons."

EMM's business in add-on memory for 155s is 50% larger than it was a year ago, he said.

Brumm cited as reasons for the upturn in its 155 business the upturn in the economy and the FS delay which nurtured the trend by users to expand their systems above the manufacturer's limit.

EMM offers an enhancement product for the 155 with more than 2M bytes.

Indicating the popularity of using enhancements, he said between now and the end of next year he expects the average memory capacity of the 155 to grow to 1.75M bytes, which means nearly 50% of the units will have over 2M bytes.

"And that market is only available to those plug-compatible makers who offer memory enhancements," he observed.

"Enhancement only comes about after a product has matured," he said, and after users have added memory to the manufacturer's limits.

Accelerating Trend

Brumm cited an accelerating trend in the firm's memory business, saying the

(Continued on Page 46)

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Uneasy Economy, FS Delay Prove Add-On Mart Boon

(Continued from Page 45)

third quarter was 20% better than the first half, and the fourth quarter is expected to be 20% better than the third. "It seems many customers are making financial commitments for additional memory to get them in this year," Brumm observed.

The firm has about 60M bytes of memory on 155s installed, he said, and is entering the 145 and 158 market in earnest.

Although EMM has offered memory on the 145 before, it has not stressed this product as it was waiting until it had its own semiconductor capability for both the 145 and 158 product, he said.

The 145 uses 1K chips while the 158 uses 4K chips, he said.

Brumm said he's anticipating placing over 50M bytes of memory for 158s in 1976.

Of the 145 add-on business for the industry next year, he said EMM expects to grab 20%, with EMM's portion growing from about eight units currently to over 75 in 1976.

The firm also plans to enter the 135 market next year, he added.

Overall, Brumm said he expects the 370 add-on market for EMM to become within two years 2-1/2 times the 360 market in terms of bytes.

Contrary to Jordan, who cited the recession as helping business, Brumm said business a year ago was admittedly weak since there was a downturn in the economy.

Business Much Better at AMS

At Advanced Memory Systems, Inc. (AMS), business is much better, according to Dick Andreini, vice-president of systems marketing.

The firm makes semi memories for the 135, 145, 155, 165 and 158 and is soon coming out with one for the 168, he said.

It also offers processor speed-up units (PSU) for the 155 and 165. The 155 PSU has been very strong for a year and a half, he said.

Andreini said the key spots for next year are the 135 and the 158, which are very strong, and he has good expectations for the 168 also.

In terms of units, demand is hottest for the 135. Demand is fairly even across the board, Andreini said.

The add-on business has been heading upward in the last six months, he said, with demand running about 15% to 20% over the previous year, he added.

Demand for add-ons for the 155 and 165 was "pretty dormant" through most of 1974, he said, until it became evident the FS would be postponed. Business in this sector has picked up in the last six months.

At Cambridge Memories, Inc. (CMI), a firm that earns 80% of its revenues from sales of add-ons for the 145, 158, 155 and 165 and only 20% from 360 add-ons, salesmen are gearing up to meet the needs of the 135 user with an add-on memory that will be available in January.

"We have a backlog there and estimate that the 135 market will be a very active one.

Don Ventura, CMI vice-president of marketing, added, "Now that the air has cleared on FS, we are seeing a renewal of decisions on CPUs, which is indicative that the memory business should pick up."

The most significant trend CMI has observed has been a change in the mix of lease to purchase arrangements – many more DP managers have chosen to sign short-term leases as opposed to purchases, he said.

At Ampex Corp., demand for the 155 and 165 core add-on is about the same as last year, said Al Horowitz, product manager.

However, he remarked, there is greater activity in the 360 area. The Extended Core Memories for the 50, 65 and 75 are starting to pick up and business in the add-on mainframe memory has increased over that of a year ago, he said.

The upward trend in 360 add-on demand has been especially noticeable in the last six months, he said.

Demand is keenest for memory for the 65, Horowitz added.

Fabritek Corp.'s Jerry Larsen, vice-president of marketing, reported the firm's 360 business is as good as last year's in terms of units, but is somewhat down in revenue because of price erosion in the market.

The firm initiated its own direct marketing program a year ago, and the campaign has picked up dramatically, he said.

Add-ons for the 65 and the 30 are the two most popular items at the moment, Larsen said.

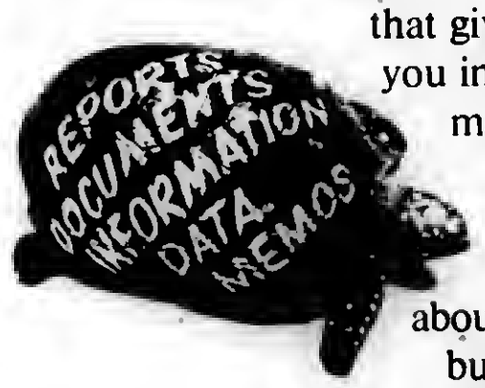
At AMS, Andreini said business has been surprisingly good in the 360 sector for the last six or eight months. Most notable demand has been for the 65 and 50, he said.

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Batch to Ebb as T/S, Remote Batch Grow

(Continued from Page 45)

tions and other. One hundred firms answered this question in the survey.

In the area of future applications offerings, whereas there was a rising percentage of the number of smaller firms offering planning/modeling, fewer of the larger firms plan to offer this in 1977 than in 1974.

The percentage of smaller firms planning to offer data base management jumps from 16.9% in 1974 to 27.3% in 1977, but remains relatively stable among the larger firms: 56.7% compared with 57.1% in 1977.

The report is available for $150 from Quantum Science Corp., 245 Park Ave., 10017.

Austrian HP Fined For Export Violation

WASHINGTON, D.C. – The U.S. Department of Commerce imposed a $6,000 fine and a six-month probation period on Hewlett-Packard GmbH (HP) in Vienna, Austria, for unauthorized reexportation of two computer systems and peripherals to Czechoslovakia.

The penalty was imposed after voluntary disclosure by HP, which indicated measures have been taken to prevent such violations from occurring again.

The licensing specialist for HP indicated he thought certain demonstration licenses would provide temporary coverage until U.S. export permission was obtained.

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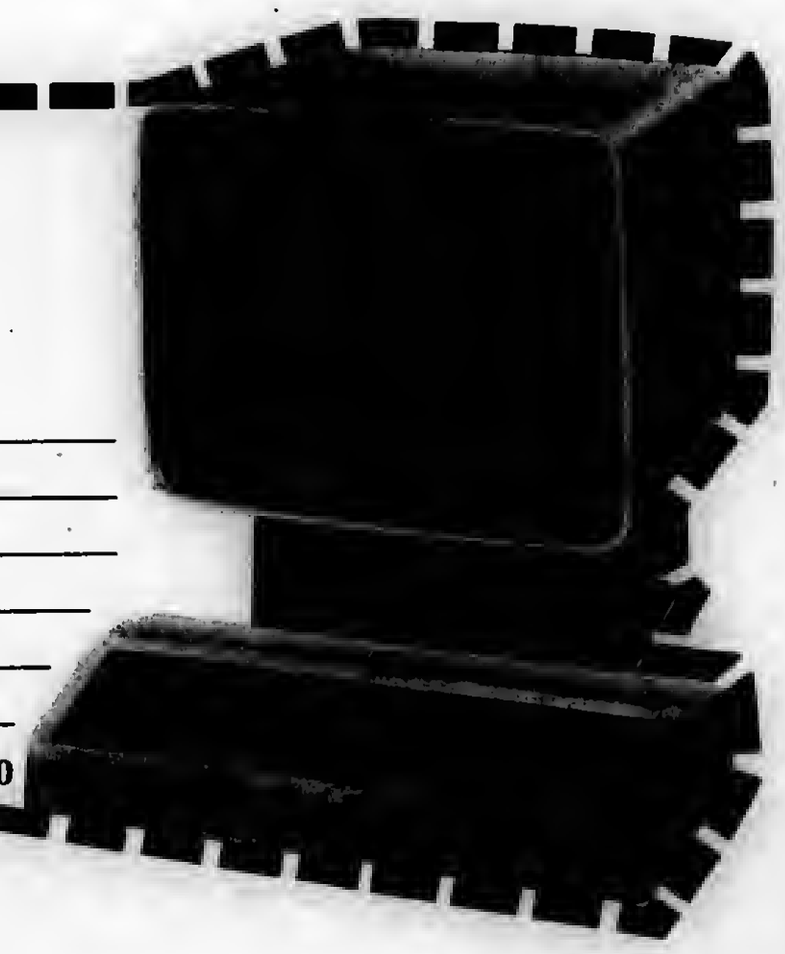
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But Has No Plans to Sell Tape

ITC Expects Improved Quality With In-House Media

By Molly Upton
Of the CW Staff

SUNNYVALE, Calif. – Media supplier Information Terminals Corp. (ITC) is becoming a media maker. Progress is proceeding on the construction of a 37,400 sq ft plant for production of magnetic tape used in its media products.

The move is a natural one, President Reid Anderson said, observing that in-house manufacture will enable the firm to control the quality of its products more and also provide cost benefits.

"We believe we can make a better quality, more consistent product," he said. The firm supplies cassettes and floppy diskettes.

Costs of tape have more than doubled in the past year, Anderson said.

Currently the firm receives shipments of raw tape, which it then slits and coats for various products such as magnetic cards, cassettes and floppy disk drives. "We reject a lot of material," he said.

Currently ITC has one supplier with whom it has worked on quality, and ITC will continue to receive shipments as a second source, he said.

The building will allow for expansion in the production of cassettes and floppies, he said. Construction is expected to be completed in February, and Anderson expects the tape production line to be operational about August.

No Plans to Sell Media

The firm has no plans to sell its media, but rather intends to consume all of the yield, he said.

ITC is not thinking of going into the magnetic tape marketplace, he said.

The cassette market is not as cost-competitive as the magnetic tape area, probably because of the complex equipment included in the cartridge, he said.

Anderson said this past fiscal year ended in June was a poor one for the firm: it grew only 60%. During the previous years it has more than doubled its growth, he said.

For fiscal 1976 he expects to almost double; "we could get close," he said, adding that it is "very hard to double every year." Last year the firm's revenues were over $10 million, he said.

ITC, which is 6-1/2 years old, has been profitable for the past three fiscal years, he added.

ITC has come out lately with media for its floppy disk that is "as good or better than IBM's," Anderson said.



CW Photo by R. Frank

Reid Anderson

OEM prices of floppy disks have been going down, but Anderson said he does not expect the prices to drop too much further, especially if customers are fussy and specify various levels of certification.

Currently diskettes in large-volume orders are selling for under $4 apiece, he said.

ITC supplies a cartridge for the 3M Co. drive and is waiting to check whether its license with 3M covers the smaller version 3M developed with Hewlett-Packard Co. (HP) for use in HP's new terminal, he said.

Although the floppy looks like a simple product to manufacture, it's not, Anderson said.

Carl Holder, product manager of marketing, said there are a lot of refinements to even the packaging of the diskette that make a difference.

Wyly to Sell Gulf, UCC Banking Division

DALLAS – Wyly Corp. has been active in negotiations to sell its Gulf Insurance Co. subsidiary and its banking division and has reached a preliminary agreement with Walter Haefner Holding AG that would allow Haefner to make an additional investment in Wyly's Data Transmission Co. (Datran) subsidiary.

Wyly said it expects to complete the sale of Gulf to Fuqua Industries, Inc. within two months.

The sale is subject to approval by directors of both firms, certain creditors of Wyly and appropriate regulatory agencies.

The sale should eliminate $30 million of Wyly's highest interest debt, the firm said. Wyly's nine-month report included a $37 million loss for Gulf, including the extraordinary loss resulting from the sale.

Wyly's subsidiary, University Computing Co. (UCC), has agreed in principle to sell its banking division to Boeing Computer Services, Inc. This sale is subject to financial audit and approval by certain Wyly creditors and directors of both companies.

Under terms of the agreement with Haefner, Haefner will increase its current investment in Datran to $47 million.

Haefner will receive an option to acquire an additional $20 million of Datran 8% subordinated convertible debentures and will subscribe to $7 million of these early next year, according to the agreement terms.

Haefner will also receive additional warrants to purchase one million shares of Wyly common. The Swiss holding company already has rights to 3 million Wyly Corp. warrants.

Haefner will assume a guarantee Wyly had made to one of Datran's vendors, thereby releasing $2.4 million of cash collateral to Wyly Corp.

The latest agreement between the two firms is subject to approval by the Federal Communications Commission, Wyly shareholders and others.



Cost Reductions Mark Mini Industry, DEC Head Says

By Nancy Freneh
Of the CW Staff

NEW CARROLLTON, Md. – If the automobile industry had the same cost reductions as the minicomputer industry, a car that cost $4,000 in 1959 would cost $112 today, Kenneth Olsen, president of Digital Equipment Corp., told a gathering of government and industry executives here recently.

A 4K DEC PDP-8 that sold for $16,000 in 1965, for example, today sells for only $2,000.

Estimates show that some two million U.S.-manufactured microprocessors and 300,000 minicomputers will be installed throughout the world by 1976. he said.

While the number of installed large computers is growing at a snail's pace compared with minis, "the dollars spent on large systems still continue to grow dramatically," he said. Olsen showed a graph indicating the installed base of large systems will be worth nearly $60 billion in 1976, compared with only about $8 billion for minicomputers and less than $1 billion for microprocessors.

However, the dollars spent on microprocessors and minicomputers systems "give little indication of the influence these devices will have on our modern society. We cannot even estimate what their applications will be yet," he said.

Olsen cited three characteristics of the minicomputer that account for their importance: "Because of their size and price they allow interactive computing," he said. Second, "they allow distributed processing and third, they allow easy communication and the generation of networks."

Minis Enjoyable

People enjoy working with a minicomputer because the machine never gets tired, never gets bored and is always interested in people. Work becomes a game, he said.

This he compared with using a big expensive system, kept behind glass walls, that "required" people to keypunch data, manually verify it and then deliver it to the processor. Some time later the user received his results, which often showed great mistakes had been made.

"It took great discipline for many people to use these systems and the efficiency of operators and programmers was poor," he said, speaking in the past tense to indicate his belief that this conditlon no longer exists.

Before computers came along, data bases were kept in many parts of an organization in whatever way seemed natural. The output of these data bases was collected or interchanged periodically as needed.

When computers came along, they were very big and very expensive and even the largest companies could afford only one. There was a tendency to put everything on one computer, and data base management generated much overhead, he said.

"There was also a dream called 'management information systems' in which there would be one data base which would contain all the organization's information; management simply would ask for anything, presented the way it wanted, and it would miraculously come out of the machine and decisions would be easy."

But the old way of keeping many data bases arranged in a natural way did have advantages, and "smaller, cheaper computers will give users the opportunity to separate out their data bases in a natural way and communicate only as needed," he said.

Each group has control over its own information, and avoiding the massive, bureaucratic organization that builds up around a central computer can bc more efficient, he said.

Networks Practical

Small computers are exciting because they makc many networks practical. In networks of many terminals, such as an airline reservation system, minicomputers are used for preprocessing or message switching to savc on phone line costs.

However, "networks of computers" – rather than terminals – "might be more important," Olsen said.

As computers are located in many places within an organization, networks tie them together for communication. The communication link may be a weekly report sent by mail or high-speed transmission lines in continuous use, hc explained.

Minicomputer networks can also be used to share resources such as in a laboratory environment. Olsen explaincd.

For example, a laboratory with many small computers can be tied to one large computer with large amounts of storage and expensive peripherals. The small computers in thc laboratory would have their own terminals and analog-to-digital converters and would bc ablc to directly control equipment and experiments.

The large computer would hold thc programs, store data and unload and load the small laboratory machine quickly and efficiently. In this way, people can have small and inexpensive machines to use freely throughout an organization and still have much of the power of a large machine, he said.

Networks of minicomputers can also be tied together to make powerful large computers with the advantage that one can start small and, as the problem grows and is understood, modules can bc added, he explained.

This allows thc user to build redundancy into the system so a single failure will not stop it. Data bases can be distributed within the system without the cost and complexity of an elaborate data management system.

Further, specialized machines can be developed and debugged without tying up the rest of the system, and parts of the system can be separated from other parts to achievc security, he explained.

Interdesign Creates Fund To Help Nonprofit Groups

SUNNYVALE, Calif. – Interdesign, Inc. has created the James V. Ball Fund to make the services and products of the company available at no charge to selected nonprofit organizations.

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Powerful enough to be the heart of a full minicomputer, the TMS 9900 is also the best microprocessor going for terminals, machine monitoring and control, and a host of OEM applications.

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The same company . . . Texas Instruments . . . makes every member of the family, and makes every member software compatible, from the bottom up. The new Model 990/4 microcomputer and Model 990/10 minicomputer use the instruction set of the TMS 9900 microprocessor. This means that software developed for the low-end computers will be compatible with the higher performance models. And, users can expand their systems with a minimum of interface and software adaptation.

The TMS 9900 Microprocessor

The TMS 9900 is a 16-bit, single-chip microprocessor using MOS N-channel silicon-gate technology. Its unique architecture permits data manipulation not easily achievable in earlier devices. With its repertoire of versatile instructions and high-speed interrupt capability, the TMS 9900 microprocessor provides computing power expected from a 16-bit TTL computer.

The Model 990/4 Microcomputer

It's a complete computer on a single printed circuit board using the TMS 9900 as its central processor. The 990/4 is ideally suited for terminal control, peripheral device interface control, and as a CPU for OEM customers.

In addition to the TMS 9900 microprocessor, the 990/4 microcomputer contains up to 8K bytes of dynamic RAM, up to 2K bytes of static RAM and/or PROM, eight vectored interrupts, front panel interface, real-time clock input, two I/O buses for low- and high-speed devices, and optional ROM utilities.

With the 990/4, you can select a low-cost OEM package, a 7-inch or 12¼-inch rack-mountable chassis, or a table-top enclosure . . . and memory expansion to 58K bytes.

Price: The Model 990/4 microcomputer with 512 bytes of memory is only $368* without chassis and power supply. This same model with 8K bytes of memory is only $512*.



State-of-the-art TMS 9900 microprocessor . . .16-bit, single-chip CPU with minicomputer instruction power.

The Model 990/10 Minicomputer

The most powerful member of the family is the Model 990/10 general-purpose minicomputer. The 990/10, a TTL implementation of the 990 architecture, provides the high-performance speeds demanded in many applications.

A memory mapping feature providing memory protection and privileged instructions supports memory expansion to two million bytes. And TILINE**, an asynchronous high-speed I/O bus, supports both high-speed and low-speed devices. Chassis options are the same as those for the 990/4.

Price: With 16K bytes of memory, chassis, power supply and programmer's panel, the Model 990/10 minicomputer is only $1968*.

Built Better Backed Better

In addition to the family of compatible hardware, Texas Instruments backs you with complete software and support. ***Standard software packages include memory-resident and disc-based operating systems;*** FORTRAN, COBOL, and BASIC compilers; and program development packages with utilities. And, for you to develop application programs for the 990/9900 family, we offer ***cross support on timesharing networks*** and standalone software development systems. One is a low-cost system using the 990/4 . . . the other is a disc-based system using the 990/10. And, a ***prototyping system*** is offered for TMS 9900 users to develop custom software and firmware modules.

TI supports you with training and applications assistance, plus an installed nationwide service network backed by TI-CARE†, our automated remote diagnostic, service dispatching, and real-time field service management information system.

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Transaction Pricing for Software Seen on Increase

By a CW Staff Writer

PHILADELPHIA – The use of transaction pricing for software will increase considerably by 1985, according to Informatics, Inc. President Walter F. Bauer.

Surveying several issues which could affect the DP scene in 1985, Bauer observed DPers should weigh the issues and do their part to optimize the future shape of the industry, he told a users meeting here.

Among the "matches" being played in the industry today are: the government vs. IBM, IBM vs. the peripheral equipment manufacturers, independent software and services companies vs. the mainframe companies, transaction vs. facilities pricing and free-standing minicomputer vs. large-scale communication-based computers, he said.

Bauer said the concept of transaction pricing appeals to both the user and supplier. Under transaction pricing, a user would be charged for a Cobol compiler, for example, on the number of Cobol statements produced.

"The appeal of transaction pricing is in its more direct relation to customer costs, allowing the customer to better understand the correlation of the DP costs to his other business costs," he observed.

"The supplier likes the arrangement because, in relating the price to value received, he hopes to get a higher price," he said.

U.S. vs. IBM Case

"The viability, if not the very existence, of about 80% of the firms in the DP industry depends on what happens" in the case of U.S. vs. IBM, he said.

One important question, he suggested, is "Will the case be decided on its technical merits or will the decision gravitate to the intangible area of the future of competition in the DP industry?"

Another is the degree to which today's growing antibig-business sentiment will offset the fine public relations image IBM has developed over the years, he said.

If there should be a consent degree, the wording in it will be crucial, he said, for if the decree doesn't consider software and services, IBM could well become the overwhelming supplier of software and services in 1985, he said.

A "cavalier approach" to decimating IBM could easily result in less competition than now exists, Bauer observed.

The match of IBM vs. the peripherals makers "may not make it into the finals of the tournament unless the government beats IBM in the semifinals," he said.

The U.S. vs. IBM case can be called "principally a lawsuit to determine whether there will be a plug-compatible peripheral equipment business in the future," he said.

The chances that the typical peripheral equipment company can survive if it is dependent solely on the nonplug-compatible marketplace is in most cases no greater than 25%, according to Bauer.

Software Houses vs. Mainframes

In the match between the independent software and service company vs. the mainframe company, the participants are "reluctant to square off at each other.

"In fact, most of them probably don't yet recognize the other as a serious or qualified opponent," Bauer said.

Although "the larger mainframe companies are offering certain items of software, most of these are not yet in strong competition with the software products made by the better software companies," he said.

An exception is in the data base area where IBM has IMS.

Although Honeywell and Univac and other mainframe contractors except Control Data Corp. have shown little interest in data services, "is there anyone among us who believes the day will not come when all mainframe companies show such an interest?" he asked.

Bauer didn't venture to guess the outcome of the minis vs. communications-based central processors, but reiterated the arguments of each side.

Contracts

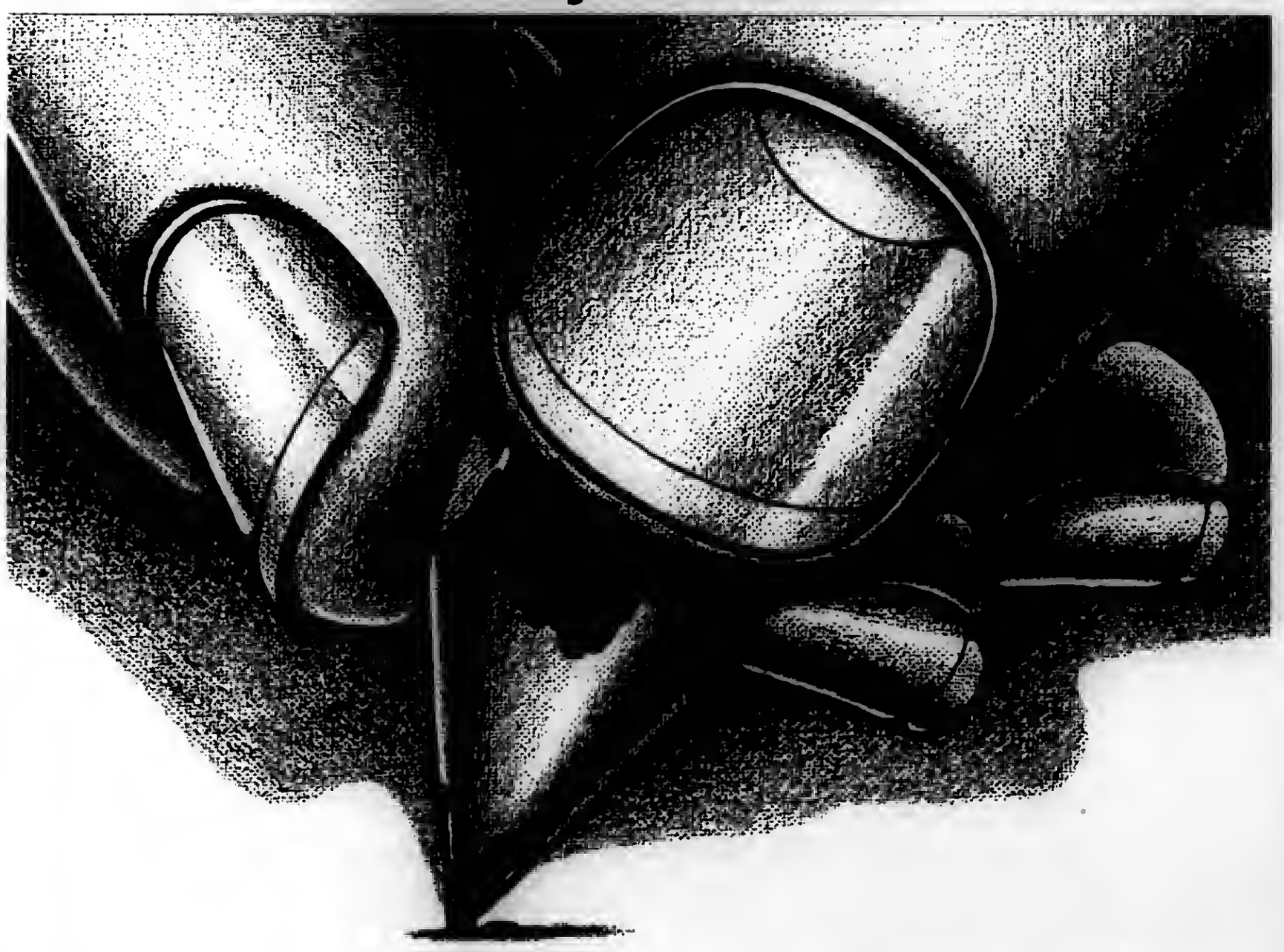
The Kennedy Co. has been awarded a contract from the Systems Technology Division of Fairchild Camera & Instrument for Model 9000 tape transports to be used with automated testing equipment.

GTE Sylvania has received a $1.6 million contract from the U.S. Army for continued work on the Army's computer-controlled processing, storage and retrieval system.

Softech has been awarded a contract from the U.S. Department of Labor's Bureau of Labor Statistics for a data base system to be used in conducting surveys of economic business activity.

Informatics, Inc. has been awarded a contract grant by the National Science Foundation, Office of Science Information Service, for a study defining the development of computer-based crises information systems.

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To Ensure Quality

'Testing' Name of Game at Centronics

By Molly Upton
Of the CW Staff

HUDSON, N.H. – Testing and quality assurance are the name of the game in the Centronics Data Computer Corp. plant here.

About 28 feet of the assembly area are devoted to assembly of the product, and the rest of the area of the large plant is used for repeated testing of the product on various levels.



Mini ovens encase printers for burn in.



Every board is tested with the aid of a minicomputer.



Model 104 With Four Heads

Centronics buys the basic mechanisms from Brother in Japan and maintains a sizable inventory in order to be able to respond quickly to large OEM orders.

An increasing portion of the board assembly work is being done in Puerto Rico, explained Hank Weiss, director of marketing, and the plant here is pleased with the quality, he said.

Centronics designs its own boards and LSI chips and makes its own heads.

After the boards are assembled and checked, they are run through an oven and then tested with a minicomputer. Each board is tested, said David Felton, director of quality assurance.

For some OEMs, the boards are exercised by the OEM equipment at a subassembly level.

When assembled in a chassis with a power supply, the units are tested again, after which the chassis undergoes a 48-hour "burn in" and another checkout.

When the chassis and the mechanism are put together, a rigorous series of tests begins. If a printer is found to be defective at any time, it is rerouted back to the source of the trouble.



Final Assembly Test



Printers undergo fine tuning of electronics and mechanism.

Fine Adjustment

After a technician performs a final test on the assembly, the unit then undergoes fine adjustment by both mechanical and electronic technicians and then on to the inspection department for both visual and computer-generated test patterns.

The units undergo burn in enclosures that trap the heat generated by the machine.

Then they are subjected to a computerized test process again, and the results are compared with those before the burn-in process.

They also go through the torture part of the room where there are a vibration table and power fluctuations.

At nearly the end of the line, one mini tests four lines from the printers for proper language configuration as well as print quality. A buffer data test and a print test for those characters most likely to have problems are performed and variable line length, paper tension and variable speeds are tested also.

The printout shows a pass or fail on each aspect tested. Then the units are tested to the OEM configuration and tested after the covers are placed on the machine.

The life testing of machines is done in the quality assurance department, and each glitch in a machine is carefully recorded, Weiss said.

Centronics maintains a central dispatch office controlling calls made by more than 50 service centers run by either Centronics or third-party personnel, Weiss said.

This gives the firm statistics on the types of calls made and the response time. About 15% of Centronics' installed base is handled through this office, he said.

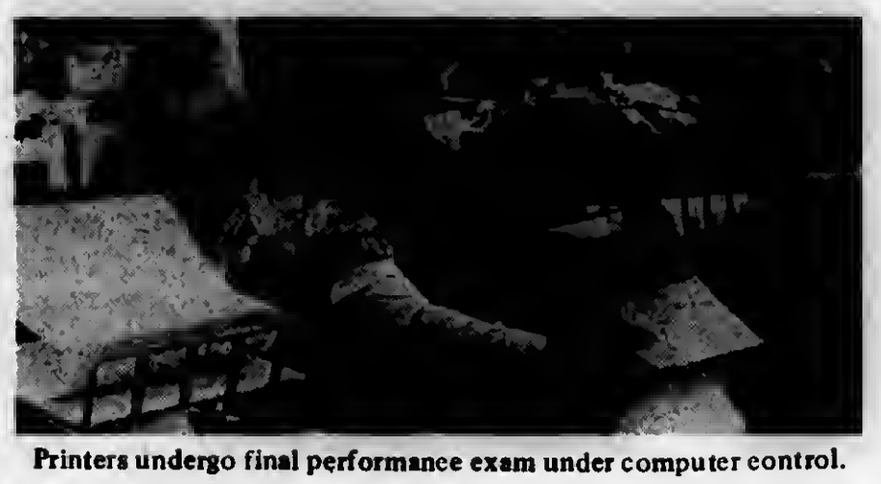
In addition, Centronics is starting a remote diagnosis system, he said. Out of 10 calls received in one day, only in four instances was a serviceman dispatched, he said.

The customers themselves call in and put the system on-line, and Centronics engineers can determine whether the problem is in the line, the printer or some other part of the system.



CW Photos by M. Upton

Assembly line handles different models. At the left is a 306 with one print head, at right is a 102A with two heads.



Printers undergo final performance exam under computer control.

Smith Named to Basic Four Presidency

IRVINE, Calif. – Basic Four Corp. has a new president, T.J. Smith, and its former president, A.M. Cosentino, has become chairman of the board.

Smith was formerly executive vice-president and director of Sycor, Inc., manufacturer of distributed data entry and processing systems.

Basic Four, a subsidiary of Management Assistance, Inc., markets small business systems and had sales totaling $30 million during the first nine months of 1975.

Other Moves

■ Ronald D. Schmidt has been appointed vice-president and general manager of the Printer Products Division at Computer Peripherals, Inc.

■ Roy F. Higginbotham has been named president of Datatype Corp.

■ Douglas A. Davidson has been elected senior vice-president and Joe R. Brooks has been appointed controller of U.S. operations of Mohawk Data Sciences Corp.

■ Robert C. Kibler has been named vice-president and treasurer of Greyhound Computer Corp.

■ Herbert D. Montgomery has been named division vice-president and controller for the Peripheral Equipment Division at Pertec Corp.

Executive Corner

■ Fred W. Morris has been elected vice-president of corporate development and a director of Comsat General Corp.

■ Harold H. Rumph has been appointed vice-president of marketing for the Equipment Products Group of Memorex Corp.

■ Dr. Philip S. Abrams has been elected vice-president of development at Scientific Time Sharing Corp.

■ Thomas M. O'Brien Jr. has been named vice-president of marketing of General Computer/Systems, Inc.

■ Harold Feinleib has been elected a vice-president of National CSS, Inc.

■ Benjamin F. Mathews has been named vice-president of finance and a member of the corporate finance committee at Computer Network Corp.

■ Gary O. Van Dyke has been named vice-president of information technology development at Informatics, Inc.

■ Francis E. Girard has been appointed vice-president of marketing at Keydata Corp.

■ Bruce D. Shapley has been appointed president of K/Tronic, Inc., replacing John A. Buchanan, who was named president of Technology Service Corp.

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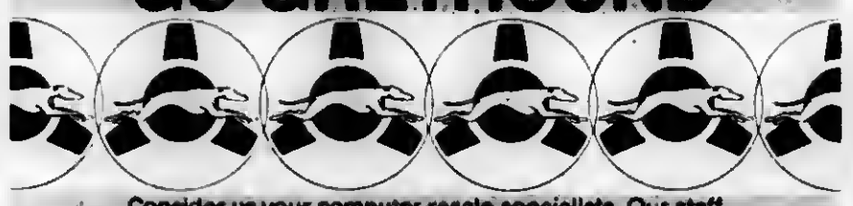
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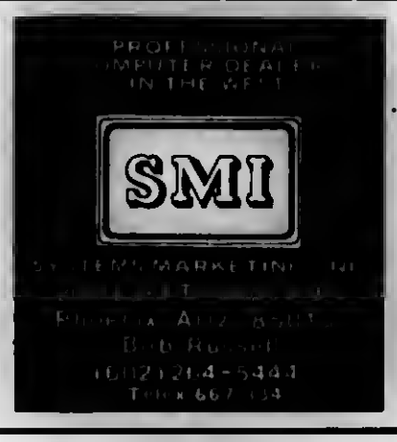
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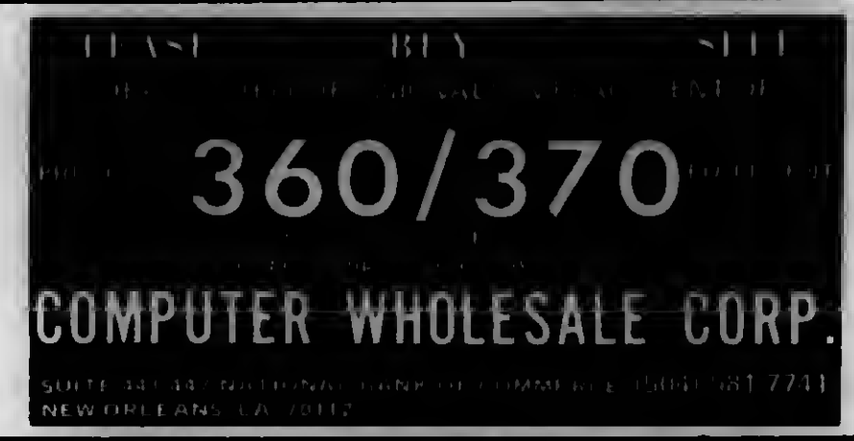
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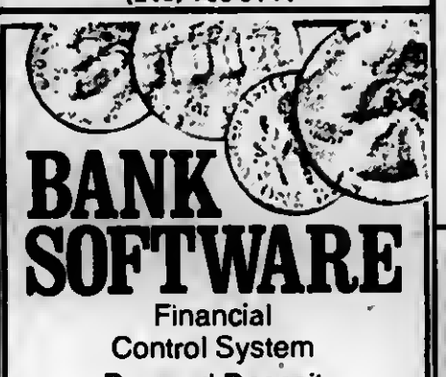
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HP '75 Revenues Rise 11%, Earnings Dip

PALO ALTO, Calif. – Preliminary figures indicate Hewlett-Packard Co.'s (HP) 1975 results were as expected – an 11% increase in sales and a slight decline in earnings.

Two firsts for the year occurred: orders surpassed the $1 billion mark and international business exceeded domestic business, according to William R. Hewlett, HP president.

For the year, sales totaled $982.7 million compared with $884.1 million last year, while earnings totaled $83,957,000 or $3.04 a share compared with $84,022,000 or $3.08 a share in 1974.

In October, the firm had projected about a 10% increase in sales, with earnings either a little above or a little below those of 1974, Hewlett said.

Earnings as a percentage of sales dropped from 9.5% in 1974 to 8.5% in 1975. "Contributing to the decline was a marked increase in our research and development expenditures," Hewlett said.

HP spent $89.5 million on R&D in 1975, up 27% from last year. HP will be introducing "a number of important new products to the market in 1976 that are expected to add a substantial increment to sales volume," he said.

Reduced profit margins in the hand-held calculator business also affected 1975 earnings, Hewlett said.

Incoming orders in 1975 totaled $1.002 billion, up 12% from $893.2 million last year.

Results for the fourth quarter showed sales of $276.4 million, up 13% over the 1974 figure of $244.8 million, while earnings fell to $21.3 million or 77 cents a share compared with $26 million or 94 cents a share in the same period last year.

The 1975 figures are tentative and have not been completely audited.

Incoming orders in all quarters were above the comparable quarters for the previous year, with the largest increase in the fourth quarter. Orders in the fourth quarter totaled $249.2 million, up 23% over the year-ago quarter.

International orders for the year totaled $502.1 million, up 18% from $425.2 million in 1974. Domestic orders rose 7% to $500.4 million from nearly $468 million last year.

Dataproducts Net Up 2%

WOODLAND HILLS, Calif. – Although Dataproducts Corp.'s second-quarter revenues were 4% lower than in the year-ago period, earnings eked up 2%.

More importantly, the second quarter showed progress over the preceding first quarter, according to the firm's President, Graham Tyson.

Revenues in the second quarter were up 8% over those of the first quarter and earnings from operations were up 41%.

Current signs indicate improved business conditions within the computer industry, Tyson said. New orders have improved and backlog has increased modestly to $36.5 million, he added.

Earnings for the second quarter ended Sept. 27 increased to $1.4 million or 21 cents a share from $1.37 million or 20 cents a share a year earlier.

Revenues dropped to $20.2 million compared with $21.1 million in the same period last year.

For the six months, earnings rose to $3.1 million or 46 cents a share compared with $2.8 million or 41 cents a share in the year-ago period.

Revenues decreased, however, to $38.9 million compared with $42.6 million last year.

The 1974 periods were restated to treat Data Card as an unconsolidated subsidiary.

Centronics Reaps 10% Quarter Rise

HUDSON, N.H. – Centronics Data Computer Corp.'s first-quarter earnings rose 18% on a 10% increase in revenues over the results for the same year-ago period, and the firm's President, Robert Howard, told shareholders he expects a record second quarter.

Revenues rose to $11.2 million compared with $10.2 million in the year-ago period while earnings jumped to $2.1 million or 45 cents a share compared with $1.8 million or 38 cents a share.

"Our company's prior investment in its future has started to materialize this quarter," Howard said.

"Our domestic and international marketing efforts have produced increases in orders and firm commitments for products from most of our customers. The broad industry cross-section of these increases indicates to us the beginning of a potential growth period," he said.

"Since the end of fiscal 1975 our debt has been reduced from $11 million to $6.5 million, which was primarily the result of improved collection of receivables and a continued reduction in inventory," Howard said.

"Improved earnings in future quarters should be expected if the current trend in sales continues," he added.

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Earnings Reports

PERTEC
Three Months Ended Sept. 26

	1975	1974
Shr Ernd	$.27	$.11
Revenue	12,545,000	10,002,000
Earnings	874,000	341,000

CONRAC
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.62	$.46
Revenue	21,766,000	19,365,000
Earnings	843,000	625,000
9 Mo Shr	1.82	1.62
Revenue	64,729,000	60,508,000
Earnings	2,453,000	2,181,000

SANDERS ASSOCIATES
Three Months Ended Oct. 24

	1975	1974
Shr Ernd	$.20	$.10
Revenue	49,318,000	38,382,000
Tax Cred	275,000	104,000
Earnings	915,000	a434,000

a-Includes $324,000 gein on sale of e manufacturing facility.

SYSTEMS ENGINEERING LABS
Three Months Ended Sept. 26

	1975	1974
Revenue	$2,842,199	$4,525,215
Loss	542,439	109,819

tTEK
Three Months Ended Sept. 26

	1975	1974
Shr Ernd	$.01	.....
Revenue	49,692,000	$47,028,000
Earnings	35,000	a(969,000)
9 Mo Rev	145,672,000	143,284,000
Loss	434,000	810,000

a-Includes write-off of $400,000 for disposal of certain manufacturing equipment.

GRAPHIC CONTROLS
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.53	$.40
Revenue	10,107,000	10,069,000
Earnings	e521,000	332,000
9 Mo Shr	1.75	1.46
Revenue	30,695,000	29,220,000
Earnings	b1,575,000	1,207,000

a-Includes $69,000 gain from sale of Canadian property. b-Includes $58,000 gein from sale of an investment.

CONTROL DATA
Three Months Ended Sept. 30

	1975 (000)	a1974 (000)
Shr Ernd	$.58	.....
Revenue	310,224	$285,228
Spec Cred	100	150
Earnings	10,036	(6,681)
9 Mo Shr	1.94	1.14
Revenue	891,604	817,958
Spec Cred	300	650
Earnings	32,777	19,312

a-Restated to reflect accounting change.

SYCOR
Three Months Ended Sept. 28

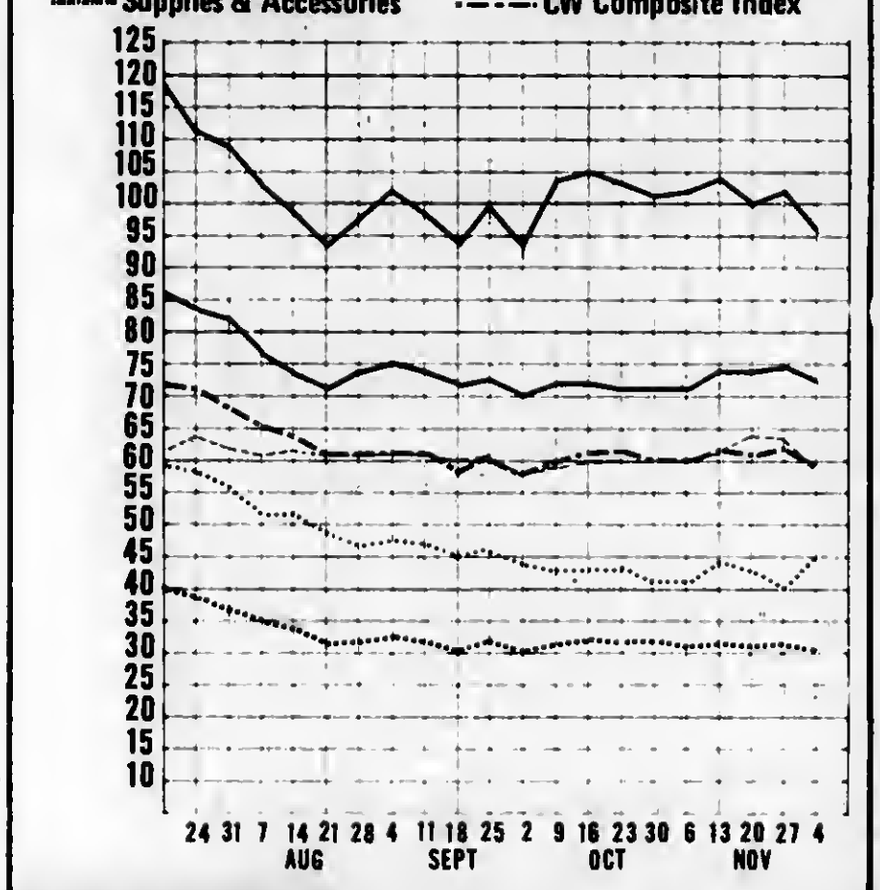
	1975	1974
Shr Ernd	$.65	$.54
Revenue	15,309,000	10,337,600
Tax Cred	330,500	585,000
Earnings	1,887,700	1,497,800
9 Mo Shr	1.57	1.33
Revenue	39,621,000	29,466,100
Tax Cred	997,000	1,450,000
Earnings	4,451,100	3,695,600

MEDICAL COMPUTER SYSTEMS
Three Months Ended Sept. 30

	197S	a1974
Shr Ernd	$.15	$.11
Revenue	1,864,824	1,597,725
Tex Cred	191,000	146,000
Earnings	405,227	308,235
9 Mo Shr	.40	.33
Revenue	5,394,190	4,512,076
Tax Cred	511,000	422,000
Earnings	1,085,502	890,827

a-Restated to reflect accounting change for R&D costs.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, DECEMBER 3, 1975

All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mess. 02139

COMPUTER SYSTEMS

EXCH		1975 PRICE RANGE	CLOSE DEC 3 1975	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-119	91 3/4	-1 7/8	-2.2
O	COMPUTER AUTOMATION	2- 11	9 7/8	0	0.0
N	CONTROL DATA CORP	11- 23	17 5/8	-1 5/8	-8.4
N	DATA GENERAL CORP	10- 39	33 1/8	-3 1/4	-8.9
O	DATAPOINT CORP	6- 26	22 1/4	- 3/4	-3.2
O	DIGITAL COMP CONTRL	1- 4	1 3/4	- 1/4	-12.5
N	DIGITAL EQUIPMENT	46-140	127 1/2	-5 1/4	-3.9
N	ELECTRONIC ASSOC.	2- 3	2	- 3/8	-15.7
A	ELECTRONIC ENGINEER.	5- 10	7 1/2	- 1/4	-3.2
N	HONEYWELL	23- 42	27	-1	-3.5
O	GENERAL AUTOMATION	4- 14	5 3/8	+ 1/2	+10.2
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	59-120	93 3/4	-2	-2.0
N	HONEYWELL INC	29- 61	32 5/8	-1 1/2	-4.4
N	IBM	158-224	210	-5 5/8	-2.5
O	MEMOREX	1- 10	7 3/4	- 3/4	-8.8
O	MICRODATA CORP	2- 8	7 7/8	- 1/2	-6.3
O	MODULAR COMPUTER SYS	5- 13	9 1/4	-1	-9.7
N	NCR	15- 39	22	-3 1/4	-12.8
O	PRIME COMPUTER INC	3- 6	3 3/4	- 1/2	-11.7
N	PERKIN-ELMER	16- 30	22	-4	-15.3
N	RAYTHEON CO	26- 59	43 3/4	-2 1/4	-4.9
N	STORAGE TECHNOLOGY	9- 17	9 7/8	- 1/8	-1.2
N	SPERRY RAND	26- 49	38 3/4	-1 5/8	-3.9
A	SYSTEMS ENG. LABS	1- 5	3 3/8	- 5/8	-14.7
N	VARIAN ASSOCIATES	7- 19	12 3/8	- 3/8	-2.9
N	WANG LABS.	7- 17	9 7/8	- 1/2	-4.8
N	XEROX CORP	47- 96	47 1/4	-4 3/8	-8.4

LEASING COMPANIES

EXCH		1975 PRICE RANGE	CLOSE DEC 3 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 5	3 7/8	+ 1/2	+14.8
A	COMMERCE GROUP CORP	2- 4	2 3/8	- 1/8	-5.1
A	COMPUTER INVSTRS CORP	1- 2	3/4	+	+9.0
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	1- 1	3/8	0	0.0
N	DPF INC	3- 6	4 3/8	- 1/8	-2.7
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 3/8	- 1/8	-4.5
N	ITEL	3- 9	8 1/2	- 5/8	-10.2
N	LEASCO CORP	4- 8	5 1/2	0	0.0
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LEVTEC MGT INC	1- 1	1/8	0	0.0
O	MRC INC	0- 4	1/2	0	0.0
A	PIONEER TEX CORP	2- 7	4 3/4	- 1/4	-5.0
A	STOCKHOLD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	7	0	0.0

SOFTWARE & EDP SERVICES

EXCH		1975 PRICE RANGE	CLOSE DEC 3 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 1	7/8	- 1/8	-12.5
A	APPLIED DATA RES.	1- 10	1 1/4	- 3/8	-23.0
N	AUTOMATIC DATA PROC	29- 65	52 1/4	-7	-11.8
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COMPUTER DIMENSIONS	2- 6	3 1/4	- 1/4	-7.1
O	COMP ELECTION SYSTMS	3- 7	5	- 1/2	-9.0
O	COMPUTER HORIZONS	1- 1	5/8	0	0.0
O	COMPUTER NETWORK	1- 3	2 1/4	- 1/2	-18.1
N	COMPUTER SCIENCES	2- 6	4	- 1/4	-5.8
O	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
O	COMPUTER USAGE	2- 4	2 3/8	0	0.0
O	COMSHARE	3- 4	2 5/8	- 3/8	-12.5
O	DATATAB	1- 2	1	- 1/8	-11.1
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 29	11 1/4	-2 1/8	-15.9
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
O	KEANE ASSOCIATES	2- 3	2 5/8	0	0.0
O	KEYDATA CORP	2- 4	3 7/8	+ 3/8	+10.7
O	LOGICON	3- 5	3 3/8	0	0.0
A	MANAGEMENT DATA	1- 3	1 5/8	-1	0.0
A	NATIONAL CSS INC	6- 14	9 7/8	- 7/8	-8.1
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	9- 17	12 3/8	-1 3/8	-10.0
N	PLANNING RESEARCH	2- 6	2 3/4	- 1/4	-8.3
O	PROGRAMMING & SYS	1- 1	1/2	- 1/8	-23.0
O	RAPIDATA INC	2- 5	3 7/8	- 3/4	-16.2
O	REYNOLDS & REYNOLD	10- 24	12 3/4	-1	-7.3
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/8	0	0.0
O	TYMSHARE INC	7- 21	18 3/4	-1	-5.0
A	URS SYSTEMS	2- 4	2 7/8	- 1/8	-4.1
N	WYLY CORP	2- 4	2 7/8	- 1/8	-4.1

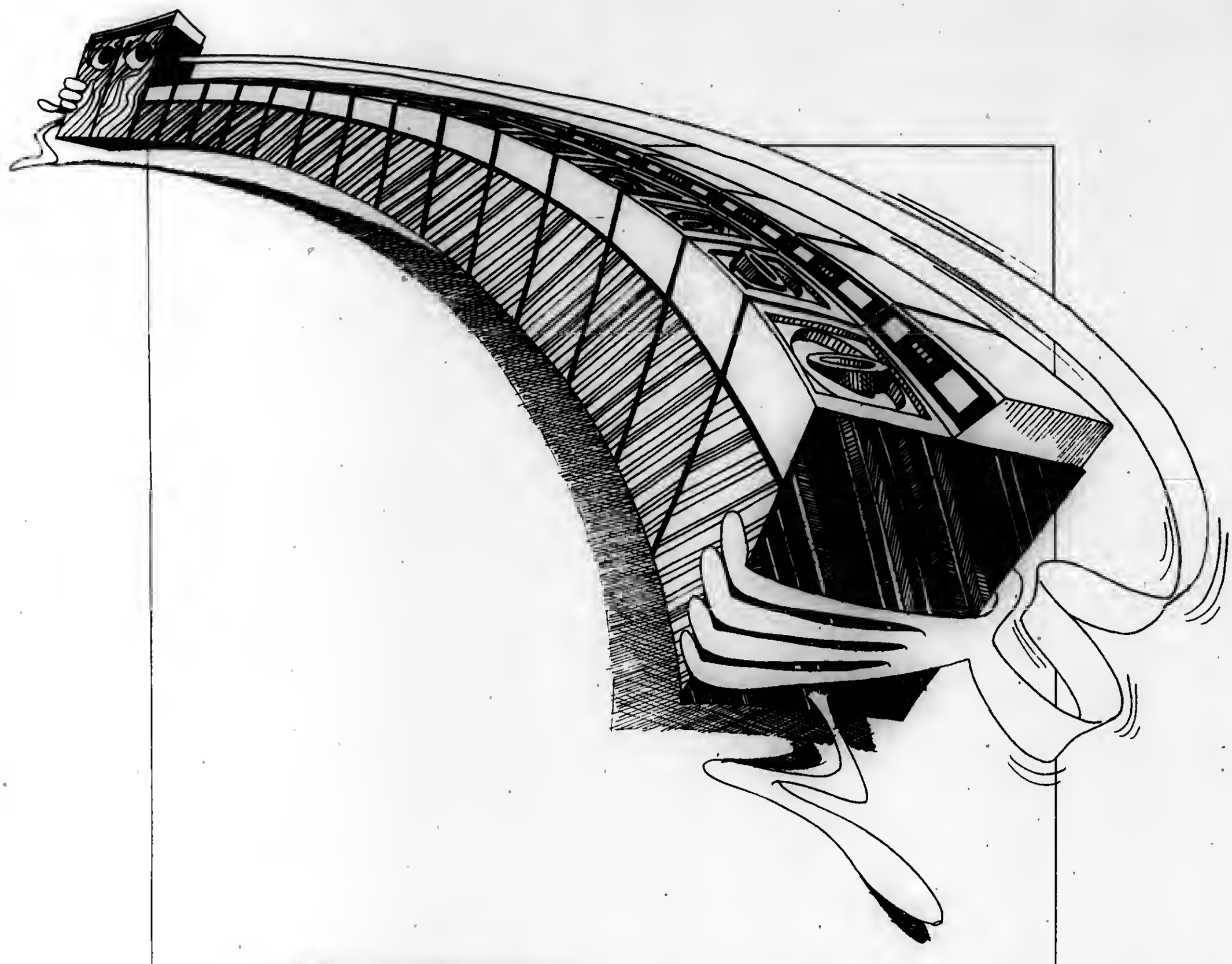
PERIPHERALS & SUBSYSTEMS

EXCH		1975 PRICE RANGE	CLOSE DEC 3 1975	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 9	7 5/8	-1 3/8	-17.5
O	ADVANCED MEMORY SYS	1- 7	3 7/8	- 5/8	-13.8
N	AMPEX CORP	3- 7	5	0	0.0
O	ANDERSON JACOBSON	1- 3	1 3/4	- 1/8	-6.6
O	APEHIVE MEDICAL ELEC	1- 5	3 1/8	+ 1/8	+4.1
A	BOLT,BERANEK & NEW	5- 13	6 3/8	- 3/8	-5.6
N	BUNKER-RAMO	4- 8	7 7/8	1	0.0
A	CALCOMP	3- 7	3	- 1/2	-14.2
O	CAMBRIDGE MEMORIES	1- 5	1 1/2	- 1/4	-14.2
N	CENTRONICS DATA COMP	7- 25	18 1/4	-2	-9.8
O	CODEX CORP	15- 38	31	-6 1/2	-17.3
O	COGNITRONICS	1- 2	3/4	0	0.0
O	COMPUTER COMMUN.	1- 2	1	0	0.0
O	COMPUTER CONSOLES	3- 7	3 3/4	0	0.0
A	COMPUTER EQUIPMENT	1- 2	1 1/4	- 1/8	-9.0
O	COMPUTER MACHINERY	1- 2	5/8	- 1/8	-16.6
O	COMPUTER TRANSCEIVER	1- 2	1	+ 1/8	+14.2
O	COMTEN	2- 8	3 3/8	- 5/8	-15.6
N	CONRAC CORP	12- 30	25 1/4	-3 3/4	-12.9
O	DATA ACCESS SYSTEMS	1- 3	2	+ 1/4	+14.2
O	DATA 100	5- 16	9	- 7/8	-8.8
A	DATA PRODUCTS CORP	2- 4	3 3/4	- 3/8	-9.0
O	DATA TECHNOLOGY	1- 3	1 1/4	- 1/8	-9.0
N	DATUM INC	1- 2	5/8	- 1/8	-16.6
O	DECISION DATA COMPUT	2- 7	2 3/4	+ 1/2	+22.2
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DIXAN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	1 1/4	- 1/8	-9.0
O	FABRI-TEK	1- 1	3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 2	2 1/4	+ 3/4	+50.0
N	HAZELTINE CORP	3- 5	3	- 1/8	-4.0
N	HARRIS CORP	19- 33	28 7/8	-3 7/8	-11.8
A	INFOTRON CORP	3- 12	7 3/4	-1 1/4	-13.8
O	INFOREX INC	2- 5	2 1/2	- 1/4	-9.0
O	INFORMATION INTL INC	9- 14	10 5/8	-1 3/8	-11.4
A	LUNDY ELECTRONICS	3- 4	4 5/8	- 3/4	-13.9
O	MANAGEMENT ASSIST	1- 1	1/2	0	0.0
A	MELCO ELECTRONICS	9- 24	15 1/4	-1 1/2	-8.9
N	MOHAWK DATA SCI	1- 5	2 3/4	- 1/4	-8.3
O	OPTICAL SCANNING	1- 3	1 7/8	- 3/4	-28.5
O	PENRIL CORP	2- 2	1	0	0.0
O	PERTEC CORP	2- 8	3 3/4	- 1/8	-3.2
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INSTL	1- 1	1/2	0	0.0
O	QUANTOR CORP	2- 6	3 7/8	- 3/8	-8.8
O	RECOGNITION EQUIP	2- 7	5 1/8	-1	-16.3
N	SANDERS ASSOCIATES	3- 11	6 1/2	- 1/4	-3.7
O	SCAN DATA	1- 3	1 1/2	+ 1/4	+20.0
O	STORAGE TECHNOLOGY	6- 17	9 3/8	- 7/8	-8.5
O	SYCOR INC	5- 22	17 1/2	- 3/4	-4.1
O	T RAD INC	3- 4	6 1/4	0	0.0
O	TALLY CORP.	1- 5	2 1/2	- 1/8	-4.7
O	TEC INC	1- 4	2	0	0.0
N	TEKTRONIX INC	10- 45	41 1/4	-3	-6.7
N	TELEX	1- 3	2 1/8	+ 1/8	+6.2
O	WANGCO INC	4- 9	7 3/8	- 1/8	-1.6
O	WILTEK INC	1- 4	1	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1975 PRICE RANGE	CLOSE DEC 3 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	BALTIMORE BUS FORMS	4- 8	4 1/2	0	0.0
A	BARRY WRIGHT	5- 7	5 5/8	+ 1/4	+4.4
O	CYBERNATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	31 1/4	- 3/8	-1.1
O	DUPLEX PRODUCTS INC	12- 25	17	+ 5/8	+3.8
N	ENNIS BUS. FORMS	5- 7	5 1/2	0	0.0
O	GRAHAM MAGNETICS	5- 13	8 3/4	-1	-10.2
O	GRAPHIC CONTROLS	9- 21	12 1/2	- 1/2	-3.8
N	3M COMPANY	43- 69	58 1/2	-2 3/4	-4.4
O	MOORE CORP LTD	39- 51	46 3/4	-2	-4.1
N	NASHUA CORP	9- 22	9 7/8	- 1/2	-4.8
O	STANDARD REGISTER	11- 23	14	- 1/4	-1.8
O	TAB PRODUCTS CO	4- 8	8	- 1/4	-4.7
N	UARCO	17- 24	19 3/4	-1 1/4	-5.9
O	VARIER GRAPHICS CORP	4- 7	4 3/4	- 1/4	-8.3
A	WABASH MAGNETICS	3- 8	3 3/8	- 1/8	-3.3
N	WALLACE BUS FORMS	15- 25	19 1/4	+ 1/4	+1.3

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; I=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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User Beats IBM To Cardless 115

By Mal Stiefel
Special to Computerworld

MARYLAND HEIGHTS, Mo. – Permaneer Corp., a local furniture and building products manufacturer, has been successfully running a cardless IBM 370/115 in its headquarters' DP facility for three months, according to Vincent Heiker, the company's management information systems director.

The 115, with 160K bytes of core, runs under Release 31 of DOS/VS and Power. The configuration includes four 3340 disk spindles with 280M bytes of storage, four 3410 tape drives and a 3203 high-speed printer.

IBM only recently introduced a cardless capability for the 370/115 [CW, Nov. 19], and first shipments from the supplier are not scheduled until the second quarter.

Permaneer replaced four keypunches, a verifier, an IBM 2560 card reader/punch and a Sycor, Inc. data terminal with IBM 3741 key-to-diskette stations and a 3540 diskette/computer input/output unit.

Four 3741's were installed in headquarters (two with communications capability, two without) and another with communications in the company's Hillsdale, Mich., plant.

Savings in equipment, labor and supplies have already reached $1,700/mo, and adjustments in operations not implemented are expected to yield an additional $900/mo, Heiker said.

Conversion was smooth, accomplished by two people in one week using a card-to-diskette utility supplied by IBM.

The equipment was delivered on Sept. 3, and fully cardless operation was begun on Sept. 9, he said.

Application programs weren't affected by the conversion; device assignments were modified in job control statements.

Keypunchers Trained Themselves

Keypunchers trained themselves on the new equipment with two days of help from IBM. After overcoming their initial apprehension, they found

(Continued on Page 4)

NEWSPAPER

COMPUTERWORLD

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Feature Code Compatibility

Burroughs 800s 1.5 Times Faster Than 700s

By Esther Surden
Of the CW Staff

DETROIT – Burroughs Corp. last week introduced its 800 series of medium- to large-scale systems which, it said, provide one and a half to four times more throughput than the firm's current 700 series.

The announcement was not unexpected. Ray W. Macdonald, chairman of the corporation's board, told a meeting of security analysts in late October the series was forthcoming [CW, Nov. 12].

Programs written for the 700 series are object code-compatible with the 800 series, Burroughs said, and can be run on the 800 system without modification.

The 800 series was designed to supplement the 700 series, a spokesman said. The B4800 in the 800 series, however, is an upgrade for 700 users, he added.

High-density, high-speed microcircuitry using Burrough's Current Mode Logic results in a 50% reduction in CPU, memory and input/output floor space when compared with 700 series models, the spokesman said.

Designed for use in multiprogramming environments, the 800 systems are said to provide enough processing power to allow users to implement extensive on-line, transaction-oriented terminal networks as well as integrated data base management systems and data processing networks.

Three Systems in Series

Three systems – the B4800, B3800 and B2800 – make up the 800 series. The B4800 systems include the B4840, B4841 and B4842 models.

The B4840 system has one CPU, one I/O subsystem with 16 to 64 channels and 200,000 bytes to one million bytes of 250 nsec error-correcting bipolar memory using the 2-byte word.

The B4841 adds file-protect memory and the B4842 has dual processors, I/O subsystems and file-protect memory.

The B3800 systems include the B3830, B3831 and B3832. All B3800 models have 100,000 bytes of MOS error-correcting main memory expandable to 500,000 bytes and a cycle time of 500 nsec.

The B3800's subsystems can have 16 to

(Continued on Page 2)

GE Says IBM Did Not Force Industry Exit

By Edith Holmes
Of the CW Staff

NEW YORK – The current chairman and chief executive officer of General Electric Corp. (GE) told the court hearing the government's antitrust suit against IBM here last week he knew of no IBM practice or act which forced GE out of the computer business in 1970.

Instead, Reginald H. Jones described the exit as a recognition of a missed opportunity on GE's part. The corporation "failed to make the necessary human and financial allocations at the appropriate time," he said.

When GE realized the opportunity presented by the computer business, it was too late to catch up – the investments required were prohibitive, he added.

The last of four witnesses called by the government to describe the GE experience in the industry, Jones' testimony served as a capstone to remarks made by Dr. John W. Weil [CW, Nov. 19], Richard M. Bloch [CW, Dec. 3] and John Ingersoll (see related story on Page 35) during the past month at trial.

While they might disagree as to the timing of the error, all agreed GE had mistakenly missed its chance to take a leading role in systems manufacture and praised IBM for its competent management in acquiring first place.

Jones, in particular, suggested IBM succeeded in the computer business because it satisfied its customers through the prices, features and performances of its systems while still maintaining a profit.

Not Government Intention

The government, in its pretrial brief and in its opening statement before Judge David N. Edelstein on May 19, indicated it never intended to show IBM forced GE out of the computer business and that GE officials would testify the corporation made mistakes.

Peter Goldberg, the attorney with the Department of Justice who is responsible for this portion of the case, did hope to prove IBM had the power to exclude competition in the sense that GE did consider that corporation's dominance in the marketplace in deciding to merge its computer operations with those of Honeywell in 1970.

The inference that GE might consider IBM responsible in some way for its demise in the industry did not follow, however.

IBM counsel David Boies asked directly on his cross-examination of the witness whether GE had been forced from the market, and Jones responded with equal ease that, to his personal knowledge, IBM had not engaged in any tactics or practices which would have caused this result.

The GE chief added that, as a member of the Ventures task force established in October 1969 to investigate the corporation's involvement in computers as well as in nuclear reactors and jet aircraft engines, no such actions "were brought to my attention."

Vice-president of finance for GE when named to the three-man task force, Jones testified the group decided to look into the computer business first because GE had not made as many contractual commitments there as it had in the nuclear and jet engine businesses and so had more

(Continued on Page 4)

Supreme Court Hears Arguments In Contest Over Software Patent

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – Arguments for and against patenting of software filled the historic chamber of the U.S. Supreme Court last week as attorneys completed the process of submitting the Thomas R. Johnston case to the high court for review [CW, Dec. 3].

Presentations hy attorneys Howard E. Shapiro of the Justice Department (for the Patent Office) and Morton C. Jacobs of Millman & Jacobs (for Johnston) were spiced by questions from the bench, especially from associate justices William H. Rehnquist and Byron R. White.

Observers noted the arguments and the questions seemed directly related to the subject, with Rehnquist in particular showing an interest and understanding of aspects of computing and data processing.

There are no legal requirements or even traditions governing how soon any given decision might be rendered. However, Jacobs indicated, after his appearance, that he wouldn't be surprised if a ruling came down "in about a month."

The court is made up of essentially the same men who heard the Benson-Tabbot case, but there are differences. Associate Justice William O. Douglas, who wrote the 1972 decision, has retired.

Associate Justices Lewis F. Powell and Potter Stewart, who did not take part in the earlier case, were present for the

(Continued on Page 3)

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Printouts of Wallace Backers Missing

By Ann Dooley
Of the CW Staff

JACKSONVILLE, Fla. – The presidential campaign headquarters of George C. Wallace here was ransacked and computer printouts naming contributors and the amounts given to the campaign were stolen over the weekend of Dec. 6.

Joann Teague, office manager for the recently opened headquarters, discovered the theft. "Whoever came in this office knew what he wanted," she said.

"The entry had to be made for political reasons" since the office is in an extremely high-security building and police have determined entry was made with a key, she said.

Gov. Wallace has made no formal announcement concerning the theft, but Joe Azbell, director of communication in the Montgomery, Ala., headquarters, denied any Watergate-like conspiracy.

"If it was done for political reasons, it was probably an overzealous individual," he said. "We're not sure why he wanted the printouts. He could have gotten them from the Federal Election Board in Washington, D.C."

To get the records from Washington, much time and money is needed, and one campaign worker thought the information might have been wanted before the Florida primary in March.

The printouts were a list of hard-core supporters in Florida. "They wouldn't do him any good," Azbell said. "These are the people who have been supporting Gov. Wallace for years, and they would never be influenced to change.

"The only purpose that might be served would be to find out who Wallace people were and what the concentrated areas of support are in time for the primary."

Besides the printouts, petty cash, letterhead paper and names of volunteers were taken. The Wallace campaign is the only one which is almost completely computerized.

The police said the case is "still up in the air" and are pursuing several leads.

Burroughs 800 Series Faster Than 700 Systems

(Continued from Page 1)

40 channels. Basic model differences are the same as in the 4800 series.

The 2800 system has only one model with one CPU, one I/O subsystem with 8 to 16 channels and an optional data rate of 1.5 or 3M byte/sec. Memory is 100,000 bytes to 500,000 bytes of 650 nsec error-correcting MOS memory.

Peripherals, Subsystems

Peripherals and subsystems for the 800 series include an I/O subsystem with up to 64 channels, each with its own Data Link processor. The processors accept I/O commands and execute them independently of the central processor.

Each Data Link processor handles only one family of peripherals. The processors have buffers that vary in size and number according to the peripheral they are serving.

The contents of one buffer is transmitted to the CPU when the buffer is full, a spokesman said.

Two types of Data Link processors are available for data communications, he added. One acts as a single-line controller and the other interfaces to a data communications processor that drives up to 32 lines.

A head-per-track disk file for random access storage was also announced with the systems. File capacity is from 5.5M- to 472M bytes with a 650 kbyte/sec transfer rate and 5 msec average access time.

Removable dual disk pack drives with capacities from 120 million bytes to 1.04 billion bytes are also included. The average access time is 33.3 msec and the data transfer rate is 605 kbyte/sec.

A large data storage subsystem that can store 348.8 million to 2.8 billion bytes of data on dual drives with an average access time of 42.5 msec and a transfer rate of 625 kbyte/sec was also announced.

A 1,500 line/min printer with 48-, 72- or 96-character sets are also available.

Memory Regulates Flow

The 800 systems' memory control feature is said to regulate the flow of data between main memory, the CPU and the I/O subsystem, with the I/O system having highest priority.

A file-protect memory feature standard on all but the 2800 prohibits dual systems from simultaneously accessing the same record, the spokesman said.

Software for the 800 series includes the integration of the DMS II data base management system with the Master Control Program so that data base management subroutines are part of the operating system, the spokesman said.

The Tabs VI reporting system provides users with reports about systems activity, including histograms, and provides the information required to charge the use of resources to the users of the systems, according to Burroughs.

Diagnostic aids allow maintenance engineers to pinpoint faults within the system and environmental monitoring techniques enable the system to transfer programs and data to secondary storage should heat levels damage a system.

The 800 systems were designed for use as host systems and as remote processors in decentralized networks, Burroughs said. As hosts, they can concurrently handle networks consisting of remote job entry terminals, interactive time-sharing terminals, on-line data entry terminals and terminals referencing and updating a transaction-oriented data base.

The systems concurrently handle application programs and direct messages and files to other systems in a decentralized network, Burroughs said. They can also be used as message-switching units and data concentrators for large-scale computer systems, the firm added.

The B2800 systems range in cost from $485,000 to $750,000 with comparable monthly lease rates from $12,000 to $18,500.

B3800 series prices range from $605,000 to $1,135,000 with monthly lease rates from $14,000 to $26,500. For the B4800, prices range from $850,000 to $3,725,000 with monthly lease rates from $19,500 to $85,500.

The 800 prices represent a 20% to 25% increase in cost over the B2700 and B4700, Burroughs said, and a 10% to 20% increase in cost over the B3700 series.

The company would not announce prices for – or even define – "typical" systems.

Free Directory Lists Schools With DP Courses

WASHINGTON, D.C. – The 1975-76 *Directory* of accredited vocational schools includes a listing of over 60 schools teaching computer programming, data processing and computer maintenance.

The National Association of Trade and Technical Schools (Natts) publishes the directory and described it as "a useful guide for locating training facilities and/or qualified graduates."

The *Directory* is free and may be obtained from the Publications Department, Natts, 2020 L St. N.W., 20036.

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Received Wrong Information

Fla. Trooper Acquitted in DP-Related Shooting Death

By Catherine Arnst
Of the CW Staff

TALLAHASSEE, Fla. – The Florida state trooper who shot and killed a man after being mistakenly notified through the state's crime computer the man's car was a stolen one [CW, Dec. 10] has been acquitted on grounds of justifiable homicide.

Six male jurors acquitted Robert Rennie Jr. after a two and one half hour inquest held Dec. 4 because "all they could go on is what Trooper Rennie believed to be the case," Cpl. M.W. Sanders of the Florida Highway Patrol said.

The victim, Frank D. Booth, was on the way to his father's funeral when he pulled off the road, where he was spotted by Rennie. The trooper radioed an inquiry on Booth's license tag number to a dispatcher with access to the state's criminal justice system.

Booth's tag bore the same number as a car stolen in 1971 because Florida changes the color of its tags each year but does not delete numbers used in past years.

A police inquiry into the criminal justice system, however, can indicate a "hot" car merely by radioing in the tag's number and not its color, which is what happened in Booth's case.

Rennie was already talking to Booth when he received the information that the car was stolen, Sanders said. He then drew his gun and told Booth to place his hands on his head.

The driver reached into his coat, causing Rennie to think he was reaching for a gun, and the trooper shot him.

An autopsy later revealed Booth had been drinking heaviliy, but this was not known to Rennie at the time of the incident, Sanders said.

"Almost everyone I talked to" is in agreement with Rennie, Sanders said. It is standard procedure for a trooper to approach a suspected stolen car with his gun cocked, he added.

"You have to cover yourself," he said. Four state troopers have been killed in Florida in the past year and a half, and 53 have been assaulted so far in 1975, he said.

This 'Hit' Not a Miss

ASHKUM, Ill. – A state trooper patrolling the interstate highway near here recently checked the license number of a vehicle apparently abandoned on the shoulder of the road.

A check with the Law Enforcement Agencies Data System (Leads) and the National Crime Information Center (NCIC) showed the car had been stolen in Cook County and entered into the system earlier that day.

The trooper discovered a young male sleeping in the rear seat and took him into custody.

Further checking revealed the man was wanted for armed robbery and rape of the automobile's owner, and he was turned over to Cook County authorities.

Supreme Court Hears Software Patent Case

(Continued from Page 1)

Johnston submission.

Associate Justice Harry Blackmun excused himself from both Benson-Tabbot and the current case.

In its half hour, the Patent Office asked the high court to review the decision of the Court of Customs and Patent Appeals (CCPA) which found in favor of a patent for Johnston.

Shapiro told the justices a patent was not justified in this case, since a general-purpose computer such as Johnston used was designed to be modified or programmed to do a specific task for the user, just as Johnston's invention did.

In effect, programs are "cookbook recipes" or descriptions of methods by which a user expresses his desires.

Shapiro said he wasn't prepared to go as far as to deny patenting to all software, but the Johnston invention "might, at best, be a 'new use for an old machine,' and that is unpatentable."

For his part, Jacobs argued software such as his client developed is the only means by which the "electrical components, logic circuits and function circuits" that make up the hardware of a computer are "interrelated and interconnected in a circuit configuration" to do anything.

Software is what makes the configuration different for each user, Jacobs said.

'Very Few' Patentable

Answering a Rehnquist question, he said most programs are well within the current state of the art and not patentable. "Very few" go beyond that point, but those that do clearly deserve patent protection, he said.

He stressed that, whether an inventor achieved a result through hardware or software should be immaterial, the means should be deemed equivalent in the eyes of the law.

The failure to recognize the equivalence leads to situations such as that caused by a recent lower court decision involving Digitronics Corp.

In that case, Jacobs said, the decision "allowed infringements of a hardware patent with impunity if the infringement is accomplished through software."

In a quick rebuttal at the end of the hour set aside for the case, Shapiro noted that the illustration of a circuit configuration of hardware and software Jacobs had used, both in his written brief and in his court appearance, had not been in Johnston's application.

Johnston's application clearly rests instead, he said in closing, on a general-purpose computer (in this case, an IBM 1400 series unit).

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Model Finds Ozone Depletion Not as Fast as Thought

By John P. Hebert
Of the CW Staff

CAMBRIDGE, Mass. – The destruction of the protective ozone layer in the earth's upper atmosphere, caused by the release of aerosol propellants and refrigerants, is less rapid than previous computer models calculated, according to the unpublished results of a computer simulation study undertaken here recently.

The rate of ozone depletion by chlorofluorocarbons – better known as Freons – was found to be 50% slower than the first depletion modeling studies predicted early in 1974, according to Dr. Derek Cunnold, a research associate at Massachusetts Institute of Technology's (MIT) Department of meteorology, who conducted the recent study.

The results of Cunnold's study, however, "are not significant – it doesn't alter the magnitude of the problem of releasing Freons into the upper atmosphere," Cunnold cautioned.

The MIT study, which was paralleled by other atmospheric modelers, merely allows the scientific community and government bodies more time to decide what to do about the problem and to discover the exact nature of the chemical reactions, which are not now known, he said.

The reduction in depletion rate "brings attention to uncertainties in theories of ozone formation and depletion" and, consequently, in the accuracy of computer-based models of the atmosphere, Cunnold said.

To accomplish the modeling of ozone depletion, a batch terminal at MIT communicated with an IBM 360/95 at the Goddard Institute in Greenbelt, Md.

Atmospheric modeling is one of the most time-consuming simulations run on computer systems, Cunnold said. The simulation of ozone depletion required a myriad of mathematical calculations and took about 12 hours of machine time to run through the 100 known chemical reactions on the 360/95, he explained.

The simulation approached a real-time portrayal of ozone destruction in the stratosphere, he added.

"When studying ozone, it is clear a three-dimensional model is necessary because ozone is produced in the equatorial atmosphere, although most of the gas is found in polar regions of the stratosphere," he said.

Any model of ozone reacting with the chlorofluorocarbons must depict the transport and distribution of molecules simultaneously, he explained.

However, results of the MIT study, which used a three-dimensional approach, did not differ significantly from other recent studies based on vertical models.

User Gets Jump on IBM With Cardless 370/115

(Continued from Page 1)

the 3741 was easy to operate, and they managed to write their own programs for the unit.

An early problem was encountered in trying to write on the diskette from the computer running with the Power spooling package.

IBM took some time to find a solution because its local office wasn't familiar enough with the equipment at the start, Heiker said.

Another difficulty arose in communication between the central facility's 3741s and the nonprogrammable remote unit in Hillsdale. (Models of the 3741 include programmable/nonprogrammable options coupled with communications/no communications options.)

The systems were linked with 128-byte messages, but the 3717 line printer tied to the Hillsdale diskette was looking for 133-byte messages including the control character.

Permaneer also found that the remote 3717 and the 3715 printer hooked to one of the home office units had different sets of carriage control characters than the CPU's 3203 printer. Permaneer's programmers provided fixes to these problems on their own.

The company decided to eliminate cards as part of an ongoing cost-cutting effort that had seen its total DP budget drop by 75% from 1974 to 1975. Floppy disks supplied by BASF Systems are helping to achieve this savings.

It felt a key-to-disk system would ultimately reduce errors, cut supply costs and decrease transcription time. It also wanted to get away from the 80-character limitation on record size and the inconvenience of multicard records.

A long-range goal was to place keyboards in source data locations to eliminate the transcription step entirely.

Clustered key-to-disk systems from about a dozen manufacturers were considered first. They were rejected after a study concluded:

- Permaneer could not afford to have all stations down for more than an hour, but a serious malfunction in the controller could incapacitate all stations for hours or days.
- Some systems in the study (not all) had to be shut down for several minutes two or three times a day while data was being spooled to tape for computer entry. Again, this would adversely affect productivity at each station.
- Users of other clustered systems said that their operators were unhappy with the units and that they were difficult to program.
- If the card reader was to be abandoned, then Job Control Language (JCL) would need to be entered on tape, but Power didn't support JCL entry from tape. Even if that problem could be circumvented, it would inevitably tie up a tape drive on the 115.
- One manufacturer offered a diskette for JCL entry, but it was much costlier than the 3741.
- The clustered systems had a high cost per station, in small configurations, in comparison with the 3741.
- The study group felt the 3741 didn't have these shortcomings. It appeared to afford cardless operation, a high degree of backup, quick interchangeability of the diskettes and a low level of program complexity.

The group also evaluated the 3741 against the Sycor cassette terminal. It decided the Sycor unit was better suited to teleprocessing, but the 3741 made more sense for the data entry applications it had in mind.

IBM Did Not Force Exit, GE Chairman Tells Court

(Continued from Page 1)

leeway for alternative strategies.

In examining GE's involvement in computers, he noted the task force eventually recommended top management reject the Advanced Product Line (APL), devised by the company's Information Systems Group, and merge its computer operations with those of another company.

APL, Jones explained, was only a conceptual plan designed to attack IBM's 360.

The study developed by the group was "certainly not an exhaustive analysis of the computer business," Jones stated. Not only did the group work for a limited number of weeks, but the computer business is complex, and none of the people on the task force had training in the field.

Yet Jones felt the study analyzed the cost estimates and the technical requirements for APL sufficiently to make the recommendation to the board of directors on April 24.

'Invention on a Timetable'

In rejecting the APL, Jones said the task force considered the project in error because it was too ambitious technologically.

It put "invention on a timetable," he said, and, to that extent, APL couldn't promise success.

GE had very skilled people in the computer area, he added, but they were few in number.

Computers were always a spin-off and never a central element of GE's core business – the generation of electrical power, the GE executive noted further.

Unable to back every horse, having sustained a net loss of $162.7 million in its domestic computer business between 1957 and 1970 and committed to the development of nuclear power and jet engines, GE decided not to take on any ventures outside its core interests in 1970.

Had the company gone ahead with APL, it would have had to invest an additional $.5 million in the computer business, according to the information systems group estimates at the time.

To the extent that the government sought to show IBM dominance of the industry, Jones' remarks and the preliminary and final reports produced by the Ventures Task Force established GE's belief that IBM led in the field.

"I cam to understand that IBM was GE's most significant competitor – the one met most often in the marketplace," Jones stated.

And, in its final report, the task force noted: "It is our conclusion, however, that the APL entails very high risks and that it is doubtful that it could be kept to time, cost and system performance schedules.

"Even if General Electric were in a position to undertake such an ambitious program, we wouldn't recommend that it invest the requested sums in such a hazardous project predicated on an all-out attack on IBM, one of the world's strongest corporations."

But nowhere in Jones' testimony, in the testimony of the other GE witnesses or in the reports by the task force did the corporation attempt to place any blame for its small portion of the computer systems business – approximately 4% to 5% – on IBM.

To that extent, the government did not seem to prove its contention that the GE experience illustrated the "very high barriers for entry, for growth and viability that exist in this market dominated by IBM," several observers noted.

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By Next Century

Model Shows Coal Could Satisfy U.S. Energy Demands

By Catherine Arnst
Of the CW Staff

HANOVER, N.H. – The architects of a system dynamics computer simulation model of coal supply and demand have concluded here that coal might satisfy much of the U.S.'s energy demands by the next century.

The model, titled Coal-1, was designed by three scientists at Dartmouth College to aid in developing long-term energy policies concerning an acceptable transition strategy from reliance on fossil fuels to energy sources not tied to finite fuel reserves.

Coal-1 was conceived three years ago as a follow-up to studies done by the Club of Rome, according to Professor Roger F. Naill of Dartmouth, who developed the model along with Professor Dennis L. Meadows, also of Dartmouth, and John Stanley Miller, an assistant professor at the University of Southern California.

Financing for the model was provided by the National Science Foundation. "We originally planned an overview of energy transition problems," Naill said. "Then we decided to move toward more policy-oriented computer models."

"The many constraints on coal demand and supply are parts of an integrated system – any policy changes in energy demand, synthetics, power plant emission standards, strip mining legislation or health and safety standards will ultimately affect the evolution of the entire energy system.

"Coal-1 can keep track of these complex interactions so the effects of coal-related energy policies can be assessed throughout the total system over time," the scientists said.

Four Interacting Sectors

The model consists of four sectors which interact dynamically: energy demand, oil and gas, electricity and coal.

The most important sector is oil and gas, Naill said. It fills 80% of the net energy demand in this country; 20% of that amount is filled by imported fuel.

Three ways to satisfy oil and gas requirements are through drilling traditional wells, imports and converting coal to synthetic fuels, he added. It is assumed in the model that oil and gas are finite resources.

Oil and gas are generally believed to follow a life-cycle pattern of production which reached its peak production level in 1972, Naill said. Even if prices are deregulated, production will continue to drop in the future, so the country must shift to alternate sources, he said.

The model showed that, even under the most optimistic conditions, where energy demand is held at zero growth, a serious gap between energy supply and demand could affect the country between 1980 and 2010.

"Ultimate energy sources such as nuclear fusion, solar, wind, ocean thermal gradient, bioconversion and geothermal are the most desirable alternatives to oil and gas, but they probably cannot be expected to provide more than 10% to 20% of the nation's energy demand by the year 2000," the model's designers said.

Could Carry Burden

Coal could carry a major burden during this period if long-term policies are put into effect now, the model showed.

These policies should include diverting a large fraction of oil and gas investment to developing coal-derived synthetic fuels; installing pollution devices on smokestacks to reduce sulfur dioxide emissions, thus encouraging coal use; enacting legislation to allow strip mining under strict environmental regulations; increasing coal miners' wages; and reducing the accident rate in mines.

The scientists said the model demonstrated that, even with such policies, there will still be a short-term energy gap in the 1980s because coal production will not start fast enough to meet demands.

"I have heard nothing but total agreement from anyone who has seen the results of Coal-1," Naill said. He added that the model had the least conflict in data of any he'd done.

"I was amazed at how little conflict there is in the basic assumptions concerning energy," Naill said.

A contract for Coal-1 is currently being worked out with the Energy Research Development Agency, a federal agency involved in developing long-term policies for the country.

NWF Hatching National Data Bank To Save Eagles From Extinction

WASHINGTON, D.C. – The National Wildlife Federation (NWF) is hatching a computerized eagle data bank to help the American bald eagle, which is threatened with extinction.

"Information that may be vital to the survival of the eagle, our national symbol, is now scattered in libraries and laboratories across the nation," Thomas L. Kimball, executive vice-president of the NWF, said. "Pesticide effects discovered on the East Coast may never come to the attention of a scientist studying the same bird in the Pacific Northwest."

After turning over 1,100 acres of South Dakota land to the Federal government for an eagle refuge last December, the NWF decided there was an "imperative need" for a one-stop clearinghouse of eagle information, Kimball said.

Using an information retrieval system, one of the first tasks will be to pinpoint all eagle nesting and roosting sites in the country. After discovering which are in danger of encroachment, attempts will be made to acquire and protect them from further destruction.

"Eagles just aren't very tolerant of man," Kimball said.

"If they are to survive, we are going to have to make accommodations. By collecting everything that is known about how and where they live and making it available to experts in and out of government, we should be able to preserve this bird that is so much a part of our national tradition."

Bald eagles, once found throughout the country, live in eight states and have an estimated population of 2,600. Until 1940 they were legally killed as predators and, since then, have decreased because of destruction of their habitats and pesticides entering their food chain.

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'Multiimage Quadraphonic Portrait'

Boston Bicentennial Features DP-Based Presentation

By Catherine Arnst
Of the CW Staff

BOSTON – A computerized "multiimage quadraphonic portrait" of Boston offers a myriad of impressions of this city to both its residents and visitors as part of its bicentennial celebration.

"Where's Boston?" is a 45-minute multimedia presentation using 40 projectors that flash 3,097 slides on eight giant screens with a quadraphonic sound track in the background.

Keeping everything moving is a Command Performer System developed by Arion Corp., a company whose sole business is supplying equipment and programs for this type of presentation.

The presentation, designed and directed by Rusty Russell of Cambridge Seven Associates, Inc., is the end result of approximately $350,000 and 1-1/2 years of work.

It is unusual for a multimedia show, Russell said, because the computer-generated program is contained on the same tape as the sound track. Most systems have a separate digital tape.

The program was adapted from Russell's technical story board, which is a graphic presentation of the film.

Engineers at Arion translated the board onto IBM-like data cards that are pencil marked and, from these, developed a tape consisting of a series of "beeps" which cue in the slides.

The sound track, originally recorded on a 16-channel, 2-in. tape, was dubbed down to a four-channel, 1/2-in. Scully tape deck format. The head configuration was modified to accept a fifth channel containing the tape of program information.

The program information feeds into an Arion digital decoder which sends commands to 32 fader units.

These units translate the commands into signals to the projectors, enabling visual transitions and image-change combinations to take place (one unit used with a single screen, three projectors and one slide in each projector produces 30 basic visual transitions and more than 500 combinations of image changes).

There are about 250,000 commands used, and the time each slide remains on the screen varies from 1/10 of a second to 10 seconds.

Always in Sync

With this type of system the presentation is always in sync, since the commands are on the same tape as the sound track, Russell said. "We are using an address system rather than a sequential system as most multimedia shows do. With our system we can talk to any projector at any time."

The result is a barrage of images flashing on and off screens in a random fashion, surrounding the viewer with the experience of Boston. Subjects include the Boston Pops, the Red Sox, the neighborhoods and their problems and a Fourth of July fireworks display that gives the audience the impressions of being at its center.

Minimal Problems

"Where's Boston?" has had only minimal problems since it started, and "the percentage of accuracy is very high," Russell said.

The weakest component in the system is the carousel projector, which "is extremely reliable mechanically but crummy electrically," he added.

Russell has designed three similar multimedia shows for New York, San Francisco and Honolulu and considers the medium one where "you can motivate, but not educate" the viewer.

"The multimedia film has never convinced anyone to do anything. What it does is raise the absorption level of the viewer so that he is highly intrigued with the subject," he said.

The Boston presentation has been seen by approximately 60,000 people since it opened June 21 and will continue running until Dec. 31 next year. It is sponsored by the Prudential Insurance Co.

U.S. Women's History Data Bank Proposed As Index of Information

PORTSMOUTH, N.H. – A women's history resource data bank has been proposed by the American Revolution Bicentennial Administration (Arba) in honor of the country's 200th birthday.

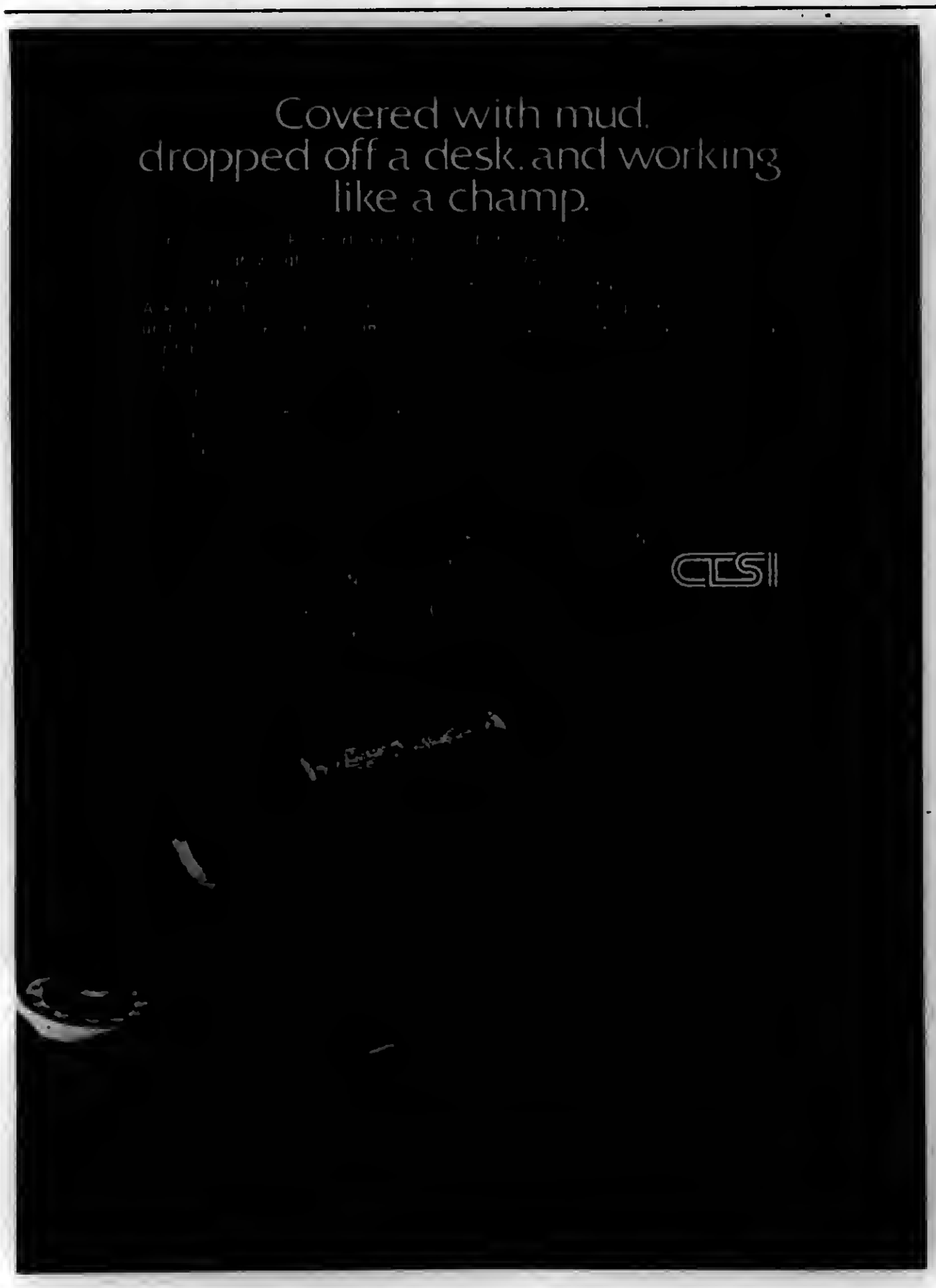
The data bank would be used as a pointer index to indicate where relevant information can be found. There are already various repositories of information around the country, and the proposed data bank would eliminate duplication and catalogue all the material relating to the subject.

At the moment the project is still in the planning stage, and its feasibility is being studied through a $23,000 cost-sharing contract awarded to the Institute for the Study of Women In Transition.

"Most people are not aware of the information or where it is available and have no way of finding it," Linda McKinney, administrator for the institute, said.

The data base would use a key-word index which would be concerned only with women's issues in the U.S., but would include a broad range and many variables within that area.

McKinney said the need for such a data base has existed for some time and Arba realized this. She said the Institute is asking anyone who is aware of existing information to contact the institute at 5 Market Street.



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*9:30 - 12:30	*Applications; Menufacturing*
*9:30 - 12:30	*Applications; Service Industries*
*9:30 - 12:30	*Networks; Networking Revisited— Effect of New Facilities and Procedures*
*9:30 - 12:30	*Forum; Network Diagnostics*
*9:30 - 12:30	*Applications; Insurance*
10:00 - 11:30	*Workshop; Network Planning & Budgeting*
10:30 - 12:00	*Workshop; CPU's and DataComm Software*
*2:30 - 5:00	*Basics; System Planning & Administration*
*2:45 - 5:30	*Networks; Network Optimizing Techniques*
R3:00 - 4:30	*Workshop; Network Planning & Budgeting*
R3:00 - 4:30	*Workshop; CPU's and DataComm Software*
3:00 - 4:30	*Workshop; Communications Processors and Multiplexers*

** Signifies sessions with 30 minute break for reviewing exhibits and for refreshments*
R Signifies Repeat Sessions

DAY II – TUESDAY, FEBRUARY 17

R8:30 - 10:00	*Workshop; Communications Processors & Multiplexers*
*8:30 - 12:00	*Networks; Optimizing International Networks*
8:30 - 12:00	*Forum; Bringing DP Power Closer to the User — Role of Terminals*
*8:45 - 12:00	*Applications; Government*
*8:45 - 12:00	*Applications; Banking & Securities*
*8:45 - 12:00	*Applications; Energy Industries*
*9:00 - 11:30	*Basics; Data Transmission Services & Modems*
10:00 - 11:30	*Workshop; Network Implementation*
10:30 - 12:30	*Workshop; Remote-Batch and Data-Entry Terminals*
*2:30 - 5:00	*Basics; Data Terminals*
*2:45 - 5:30	*Networks; Minis in Distributed Networks*
*2:45 - 5:30	*Forum; Bringing DP Power Closer to the User — Role of Small Business Computers*
R3:00 - 4:30	*Workshop; Remote-Batch and Data-Entry Terminals*
3:00 - 4:30	*Workshop; Interactive CRT and Hard-Copy Terminals*
R3:00 - 4:30	*Workshop; Network Implementation*

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DAY III – WEDNESDAY, FEBRUARY 18

R8:30 - 10:00	*Workshop; Interective CRT & Hard-Copy Terminals*
8:30 - 10:00	*Workshop; Modems & Couplers*
*8:45 - 12:00	*Applications; Hospitals and Health Care*
*8:45 - 12:00	*Applications; Computer Services*
*8:45 - 12:00	*Applications; Retailing/Wholesaling & Distribution*
*8:45 - 12:00	*Networks; Optimizing Data Entry in Distributed Networks*
*8:45 - 12:00	*Forum; Rep Session on Distributed Networks*
*9:00 - 11:30	*Basics; Data Processors & Software*
10:00 - 11:30	*Workshop; Network Management*
R10:30 - 12:00	*Workshop; Modems & Couplers*
10:30 - 12:00	*Workshop; Data Transmission Services*
1:30 - 3:30	*Networks; Role of Remote-Batch Terminals in Distributed Networks*
R2:00 - 3:30	*Workshop; Data Transmission Services*
R2:00 - 3:30	*Workshop; Network Management*

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Editorials

Delaying Tactics

More than a year has passed since the Department of Justice filed its antitrust suit against AT&T, and there has been virtually no progress.

A favorite delaying tactic of defense lawyers is to challenge the jurisdiction of the court to hear a particular case. By raising the question of whether the court should hear a case, the lawyers manage to postpone the inevitable fact that at some point they will have to address the merits of the charges.

In the AT&T suit, it was both the phone company lawyers and the judge who raised the issue [CW, Dec. 10]. The Federal Communications Commission's (FCC) legal staff is now wrestling with the problem and expects to have an answer for the court soon on whether the commission should get the case.

Legal experts point out that AT&T probably could get a more sympathetic hearing before the FCC than it could in a U.S. district court.

But one of the Justice Department's charges of antitrust violations against AT&T includes a demand that the Bell System divest itself of its 23 operating companies. And no one is sure whether the FCC would have the power to order such a split-up.

All of this legal thrashing points to a long-lingering suit with no quick resolution of the issues.

Meanwhile, the AT&T lawyers have earned their fees by perpetuating the status quo; the Justice Department is stymied in its attempts to begin discussion of the antitrust charges; and the customers who may be the victims of monopolistic practices have little hope for speedy relief.

DPers Take Blame

It appears that 325 persons working on the New York State lottery, including the DP staff, will have to take the blame for lack of management control at the top.

A report by Arthur D. Little, Inc. (ADL) found there was no overall systems or programming control exercised by lottery officials over the DP staff [CW, Dec. 10]. And apparently the system (or lack of it) was left wide open for unintentional error and/or fraud.

Nevertheless, it seems unreasonable for Gov. Hugh Carey to assume that firing the entire staff will help clean up the system. There were undoubtedly conscientious persons within the DP and other staffs that were doing their jobs to the best of their ability.

If only one programmer really understood all the programs, as ADL claimed in its report, it is difficult to see what is accomplished by firing that one keeper of all wisdom.

There are many analogies that could be drawn between the lottery's problems and the fiscal threats plaguing New York City. Carey seems to think that, when no one is minding the store, the best approach is to burn the store down.

Maybe, instead, it is the management team at the top in New York State that needs some careful manicuring.

In any case, a rebuilt lottery staff will now have to regain the confidence of those who will buy the tickets. A restructured DP operation will have to be one of the cornerstones of that project.



Letters to the Editor

CW Could Please All Subscribers With Pro-IBM, Con-IBM Editions

I have a suggestion which will enable *Computerworld* to do the impossible – that is, to please all of the subscribers all of the time.

Many newspapers, such as *The Wall Street Journal*, put out regional editions. CW needs to put out two editions each week; one slanted pro-IBM, the other con-IBM.

Then, by merely checking the appropriate box on their subscription forms, subscribers would all be happy with the publication.

Two editions would also give advertisers a chance to pitch their products differently to each group. (But heaven help the poor paste-up person who mistakenly puts the con ad in the pro edition!)

The only subscribers CW might lose would be those who are neutral-IBM. In my seven years in the business, I've never run into anyone who was neutral-IBM, so I don't think this would affect CW's circulation figures.

Seriously, maintaining a neutral editorial policy is akin to walking over Niagara Falls on a strand of barbed wire – barefoot!

CW is the fakir of computerland for succeeding so far. May it have continued success.

D.C. Stultz

Tampa, Fla.

Less Impressed With Unimpressed

David L. McMonigle's letter "Unimpressed With Overly Impressed" [CW, Dec. 3] left me even less impressed with his appraisal of the situation.

After all, when 85% of the software enhancement suggestions, formulated by common NCR users, screened and improved by Masterson's user committee and presented to NCR, are actually implemented into future NCR software releases, why shouldn't we users be enthused?

IBM will shrink to less than 10% of the market before allowing its users such a privilege.

In my personal experience, NCR's marketing practices have consistently configured hardware systems properly, whereas the higher powered IBM marketing people often employ undersell, biased configuration bidding and other devious tactics.

McMonigle commented that "NCR historically has not understood the problems of a diversified high-development computer applications environment."

Again, my experience has seen the quicker solving of technical problems via a well-organized chain of command to corporate software people at NCR.

Also, preferring to design my own software in contrast to 'packages' leaves the success and complexity of computer applications to my capability and comprehension of my company's unique system requirements. I cannot hang this responsibility on any vendor.

Finally, McMonigle's statement that "an 'unpackaged' NCR user will find the going rough, unless things have changed drastically" would be precisely correct if the word "rough" were replaced with "easier."

Ken Yoder

Elkhart, Ind.

NCR, Masterson Need No Defense

The letter from David L. McMonigle indicating his displeasure with Don Masterson's letter supporting NCR [CW, Nov. 19] was a classic example of hasty and poor judgment.

The NCR User Community (some 5,000 Century users) recognizes the significant contribution of both Don Masterson and his company, Midland Cooperatives, in advancing the field of computer technology.

Masterson has served for several years in the field of software improvements and is presently a leading member of the Software Advisory Committee (SAC), a function of the National Users Group.

His presentations of Midland's "On-Line Management Information Systems" are among the best this writer has heard, in spite of the fact that their hardware is poorly configured (according to McMonigle).

Don't make the mistake of interpreting this letter as a defense of either Don Masterson or NCR. Neither really needs it. Masterson's reputation stands on its own, and NCR has more than fulfilled its commitment to our needs, which is all we're qualified to speak for.

We installed our (poor) configuration four years ago and have not changed a thing in that time. We will be upgrading next year to a larger CPU and large disk drives.

None of this was dictated by top management; it was planned by top management. Too bad it doesn't work in McMonigle's company.

Donald R. Collins

Shelbyville, Ind.

Right About One Thing

I hope Edwin Levy doesn't "yawn" his company down the "tube" [CW, Nov. 26]. His unsophisticated CRT does tell whether his account code exists or not, but certainly does not tell him if it is invalid.

I wonder if Levy ever inverted two characters of his account code and arrived at another legitimate account code?

It is possible Levy's application does not require the check digit, but shame on him to think no one does.

Levy is right about one thing; his software is about three inches off the ground on the totem pole of sophistication.

Richard Blasko

New York, N.Y.

(Other letters on Page 12)

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90 Other: _____

Detach here, fold, and place in post-paid envelope attached through binding.

Negative Exports

One of the curious recurring themes of the last Washington decade has been the continuing refusal of the Pentagon-dominated Office of Export Control to permit sale of fancy computer systems to Soviet Russia. The Commerce people rechristened it the Office of Export *Administration* two or three years ago, probably on the same theory that makes homely mothers name their infant daughters Gloria or Belle.

Whether Kennedy or Johnson or Nixon or Kissinger are in charge up topside, licenses to export single large systems, let alone the considerable volume that no one even considers suggesting, are turned down. The latest and one of the most scandalous is the rejection of IBM's request to sell a 370/158 reservations system to Intourist. Jack Robertson reports that "industry sources" – wish mine were as good as his – indicated that DOD and the regrettable Central Intelligence Agency were worried because of the very large number of fancy disk drives involved!

Of course that sounds like the worst kind of nonsense, given the announced position at the end of the Sixties, when I was an insider, that the objective is to withhold *technology* from the Communist Bloc. Clearly the first two or three 3330s, like the first step into the proverbial elevator shaft, are the crucial ones; dozens thereafter hardly matter. But we all realize from noncomputer evidence that technology is not really what is at stake. If it were, we would not be selling our chip-laden fighter planes and missiles to Syria and Egypt. That technology is sold outside of Commerce Department control, and eagerly. Putting aside the argument that Grumman and Northrop are special clients of the services, and that the Mirage gives General Dynamics more fits than CII ever will IBM, we should focus clearly on the central question: If Defense is willing and even anxious for its aerospace contractors to sell quantitites of their most lethal products to countries beyond American control, and reveal very advanced digital technology early on, why will it not permit IBM and its competitors to sell quantities or even occasional single copies of big DP systems?

One thought does occur: Is it possible that a big enough order would make the difference? Perhaps Washington would not OK the sale of *one* F-16? But hundreds, at literally billions of dollars – was that too much to resist?

If so, IBM ought to scuttle around and sign up Moscow for, say, a thousand 370s, especially the new super-168s. Might work! The technology argument is clearly garbage, and all the struggling my poor little advisory committee did with channel characteristics and memory speeds and sizes was wasted; the real hotshot stuff goes into inertial guidance computers and airborne weapons controls first, and only later into general-purpose ground gear. In fact, it is sold in grim quantities to our potential enemies long before it appears in banking systems and commercial data communications.

I believe IBM and its rivals should demand a congressional inquiry into this discrepancy. Such companies have expertise in both areas. They can describe, perhaps in secure surroundings if the padlock-your-lip boys make trouble, just what levels of fancy digital technology go into the planes and missiles we sell, versus the levels in the 370 and its peripherals, or the Univac or Control Data equivalents. I would certainly volunteer to testify at such a hearing and could suggest others who willingly or under subpoena would have more recent knowledge. It isn't so much that we need the trade balance, or that CII will put the American computer companies to rout; I just plain old dislike some dour general, who hopes to be a vice-president in aerospace next year but who hasn't a hope of cracking Armonk, telling IBM "no sale" while he promotes super-fighter sales to the uglier Arabs!

We have seen more and more clearly in the last decade that the Communist countries, even the livelier ones like Poland and Romania, cannot close the five- or six-year gap in computer technology between their efforts and those of Western societies – indeed, cannot keep that gap from widening still further. We could sell the top of the new 1976 IBM line, and the big new machines CDC *claims* it is readying, in quantities to match our wheat exports. And in 1982, when the sixth generation is announced, the gray, glum *communistas* will be still struggling with OS/VS/NFS software and cursing capitalist perfidy, especially if IBM cons 'em into taking PL/2!

The proudest flag we fly today around the world is our technical proficiency: our computers, our chip wizardry, our basic science. And our 747s, with intertial navigation yet, of course: fly to America and see the latest in information science (but eat Iranian caviar and drink good Moselles while *en route!)*

I repeat, it's our proudest flag. Why not fly it freely, everywhere – in the GUM department store and at Intourist; in Moscow and Leningrad, in Warsaw and Belgrade, and in Red China some day. We have everything to gain and nothing to lose.



Herb Grosch

Despite Written Agreements

Unconscionability Concept Can Cure Contract Blues

The Taylor Report
By
Alan Taylor, CDP



The story in Judge Morse's courtroom was depressingly familiar. After an investigation, a salesman and his manager had produced a flowchart which detailed how their firm's computer would automatically handle all aspects of the De Luxe Co.'s bookkeeping, accounting, reporting and inventory control.

Not merely that, but they also had assured De Luxe the machine had a built-in "40% expansion factor."

De Luxe signed the contract, which excluded any warranties except defects of workmanship found within 90 days, the vendor's liability for consequential damage and vendor responsibility for other writings such as proposals or oral representations. The contract also limited liability for any claim.

The system was never delivered, but was upgraded. The upgraded system ran eleven hours a day and didn't complete the job.

The user sued, and, in 1975, over eight years after the contract had been signed in December 1966, the judge knocked out the clauses which, on their face, prevented the user from getting damages.

The judge's reasoning was based upon a legal concept called "unconscionability" which could be important to many computer users who are faced with form contracts with similar types of exclusions – and still are asked to trust the proposals the same vendors try to disown!

How Unconscionability Applies

Clauses can be stricken from computer and other contracts when their enforcement would "unfairly surprise" the party damaged. (Legally, there is also the case of when he is "oppressed" but "unfair surprise" seems easier to understand and more often covers the type of things that happen in computer cases.)

One way to recognize such unconscionable clauses is to look to see how one-sided they are – under the circumstances existing at the time the contract was made.

These circumstances are those surrounding the particular contract itself, so it is perfectly possible that the same terms may be legal in one case while being illegal at another installation or at the same installation at some other time.

In the De Luxe case, the circumstances included fraud and deceit at the time the contract was made. The judge used his policing powers to permit direct damages in the case of negligence or breaches of warranties and for both direct and consequential damages where deceit was involved. (He didn't permit consequential damages for warranty breaches.)

The action of the computer vendor in disowning the flowchart and its written specifications about the machine capacity was the element of "surprise" Morse found existed.

He pointed out that the disclaimer was "overbroad," giving the seller not just 80% of the pie, but something close to 94.44% (I don't know where he got his figures).

Surprise in this case, the judge found, came from the attempt to disown the flowchart and the various written and oral representations about the capacity of the machine. This included the "40% expansion factor" and other such claims.

Such an idea is quite understandable. If a vendor submits a proposal to a user for an equipment purchase saying one thing and then asks the user to sign a contract indirectly disowning the proposal, the whole idea is distinctly surprising as a way of doing business. But many users have signed just that sort of order.

'Oppression' Concept

Oppression, the other legal concept, was also found here. The disclaimers made it possible for the vendor to send in some equipment that couldn't be meaningfully used to do the inventory control, etc.

Yet the whole idea of the contract was that the user would get equipment that could do the job. De Luxe just wasn't interested in entering the second-hand market for computer equipment or using it as a doorstop.

It wanted and reasonably expected equipment it could use, but the disclaimers permitted the vendor to demand full payment and yet not supply such equipment.

This denial of "reasonable expectation" brought the contract into the area of oppression and thus of unconscionability.

Again, there are many contracts which on their face would permit reasonable expectations to be ignored. Look, for instance, at some of the delivery and payment provisions.

Often there is no mention of the vendor's duty to deliver all the equipment, but any delivered must be paid for within 60 days or so. So someone could deliver a lot of boxes described as peripherals, fail to deliver the central processor and still demand payment!

That might well contradict reasonable expectation and so may not be legal.

Users, then, when they think they have been denied their reasonable expectations or have been unfairly surprised by some effort, can at least look a bit further than the contract terms.

Just because it's printed there does not always mean it's true, no matter what people would like you to believe.

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Combined With Common Sense

Psychology Reduces Data Entry Inefficiency

By E.M. Hughes
Special to Computerworld

Data entry is usually the weakest link in the data processing chain. Yet many of the problems which beset data entry divisions can be solved, when properly understood, by the application of a little common-sense psychology.

A study of keypunch/keytape personnel reveals two major factors underlying the majority of data entry problems: the low education level of the average keypunch/keytape operator and the lack of any feeling of responsiblity to the employer or company.

The first of these leads to slowness in learning and distrust of new equipment; the second to tardiness, absenteeism and a marked reduction in the number of hours which are spent working instead of conversing, using the telephone or making prolonged trips to the water fountain.

Almost all data entry problems can be traced to one of these two factors, but the problems themselves take many forms.

Many of the most vital problems stem from the slowness with which the average keypunch/keytape operator learns. For example, operators generally work most efficiently if they are taught each data entry job separately and individually, while making notes to which they will refer whenever the job appears.

Many errors and delays result from the inaccessability of information on how a given job is to be handled and the operator's unwillingness to wait until the answer is available.

This is especially true if finding the answer requires checking a booklet shared by several operators or waiting until the one person who knows the answer is free.

In cases like this, the operator usually takes a consensus of her neighbors' opinions (thus interrupting their work) and makes an "educated guess" – which is only correct about 50% of the time.

This problem increases drastically when the operator knows that keystroke averages are being checked, since pauses to find answers will lower the average.

Common Superstitions

Insufficient or inaccessible information on a job produces another of the curses of data entry: superstition.

One of the more common superstitions is that if a several-letter handwritten abbreviation frequently appears in some particular job, any handwritten abbreviation occurring in that job which has one character in common with it and is of approximately the same length is the same as the usual abbreviation and is to be entered that way.

Thanks to this superstition, LGN becomes LOG and CHG becomes CAB with suspicious regularity. Other and even more disastrous superstitions develop when alphabetic and numeric characters are insufficiently distinguished.

Under the circumstances, it is not surprising that programs bomb or produce unlikely results.

Reader Commentary

One of the most difficult problems to locate and solve stems from incompetence at a slightly higher level than that of the common operator.

Data entry equipment is usually programmable to simplify the operator's job by automatically executing skips, duplications and the like.

As programming is rarely entrusted to the individual operator, especially on systems where a mistake in programming can cause the erasure of the day's work, most programming is done by lower echelon supervisory personnel.

Unfortunatley, there is seldom much difference in background between these people and the common operator, with the consequence that the programs they set up are often inefficient for entering the data or so carelessly done that whole fields may be misplaced.

This leads to opcrators surreptitiously changing the program to more closely suit their needs or to blaming all errors on the program whether or not it was actually at fault.

A different set of problems arises from the operators' failure to feel any sense of responsibility to their employers.

These include the "overtime syndrome" (failure to do work during working hours so the paycheck can be artificially boosted by finishing the work, with many delays, in overtime); tactics to excuse leaving work early, such as arguing with an adjacent operator or spilling something on oneself; prenotching blank cards by autoskipping them through a verifier so that, when punched, they will appear to have been verified; failing to correct errors when verifying in order to maintain a high keystroke average; and all the many forms of buck passing.

Average Operator

The source of all these problems is found in the operator herself. The average operator is female, between 18 and 40 years of age, married or divorced with children and has not completed high school.

She holds her job partially for its income and partially for the opportunity to make new friends or meet new boyfriends.

She doesn't worry about losing her job if she works in a town with a fairly large DP community since she can always find another.

Any job she holds take a doubtful second place to her family and other activities.

Once one understands this outlook, solving these problems becomes less difficult. One cannot alter the rate at which personnel assimilate instructions, but one can reduce the related problems by dividing the labor (thereby decreasing the number of jobs that any individual operator must master), keeping a careful check on new additions to the staff to ensure that they learn jobs correctly and maintaining constant supervision both to answer questions which arise and to discourage inactivity.

Supervision, Psychology

Improving the amount of the working day actually spent in working requires a combination of supervision and psychology. Unless only nonsmokers are hired, forbidding smoking in the actual keypunch/keytape area almost guarantees that the operators will take prolonged breaks throughout the day whether they smoke or not.

In most facilities, arranging smokers near air-exit ducts and away from both nonsmokers and any sensitive equipment will stop this excuse for inactivity and up the output noticeably.

Similarly, where restroom and telephone facilities are limited and inside the data entry area, more excuses for time loss are removed.

On the other hand, permitting operators to have coffee, water or some other beverage while working will generally prove advantageous.

Most operators will go to great lengths to protect their machines and keep this privilege, so little is lost except the time they would otherwise be spending to go to the water fountain.

Make Job Desirable

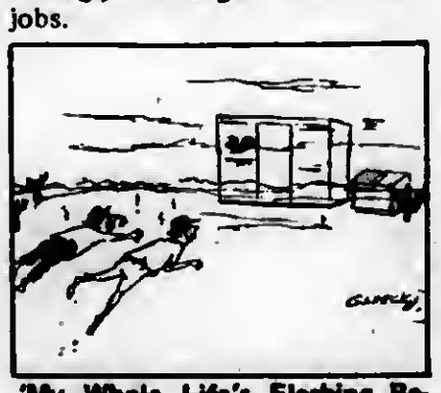
These seeming concessions both eliminate many excuses for not working and make a shop more desirable to the operator. Given them, operators will often work for slightly lower pay, especially if flexibility of working hours is an added incentive.

But these "concessions" have another and more ciritical value. In a shop which permits these comforts, operators will respond to stricter control.

Hard and fast rules can be established and maintained with minimal effort, and the firing of troublemakers or the rearranging of seating to reduce conversation will be accepted with good grace.

In a restrictive shop, operators who are fired for poor work, low output or disruptiveness take on the appearance of martyrs – and usually take a few of their fellow operators with them, by resignation, when they go.

In a more "liberal" shop, operators who are fired are rarely pitied and, even when they draw sympathy, the others are too content with their situation to willingly endanger their own jobs.



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An Open Letter to Gerry Larsen

Where Law Affects DP, Form Does Equal Substance

The following is an open letter to Gerald H. Larsen, author of "Not Form But Substance the Issue at 4th and Main St." [CW, Nov. 19], a reader commentary written in response to Roy N. Freed's "Definition of 'Software Program' Can Vary," which appeared in the Oct. 15 "From a Legal Viewpoint" column.

By Roy N. Freed
Special to Computerworld

Dear Gerry:

Thank you for your comments. It is always good to get feedback on one's observations. We need lots more of it, especially truly professional interaction.

Since we have an interplay going, I'm going to keep it up. My contribution to this round will be fairly brief. Maybe we can get others to join in. Let's try.

For now, I merely want to observe that, in many legal circumstances, form *is* substance, as shocking as that might appear at first hearing.

What that really means for our purposes is relatively simple – namely, that it is important to pay attention to legal ramifications and consequences (such as taxes, corporate law, tort liability and antitrust) in structuring transactions in the computer industry for their legal substance and to use carefully designed forms of language to reveal the genuine underlying legal substance.

More specifically, there simply is a significant difference between leases of goods and licenses to practice processes and between leases and either conditional sales or secured loans.

Good lawyers always respect substance over form. They would fail their clients if they did not. Hence, your own argument tended to corroborate your second moral. It seems as if we really have a straw man to contend with in our verbal jousting.

Economic Impacts Differ

In the real world, differences in legal approach – reflecting legal substance – can have substantially different economic impacts because we do have myriad legal rules based on classifications of transactions and properties and reflecting public policy. That is the fact we have to recognize and live with.

Carelessness in respecting that reality can have serious adverse effects. For example, Bunker-Ramo dressed up its stock market information service as a lease of a terminal and forced its customers to pay sales taxes on the entire charges. Sloppy form produced an unwarranted imposition on them.

In the same vein, would you deny the validity of the question of how, where the economic consequences are attractive, it is possible to include the cost of acquiring the use of a software program – whatever that term means – in the value of what is clearly Section 38 property in order to secure a federal investment tax credit based on that cost?

So object as you might, our legal structure does involve categories – many of them. It is the height of naivete to ignore that fact.

Regardless of our notions of proper sets of legal rules, we have to take a legal – rather than a theological – approach to the applicability of legal rules in the computer industry. Of course, any changes that might be made in the system would, of course, be applicable across the board to various technologies past, present and future.

Hence, we may ignore the present structure only at our peril while it prevails. One might be foolhardy with his own resources; a professional who is responsible, directly or indirectly, for the resources of others does not have that luxury. Ask your own lawyer.

In your book on computer contracting, you suggested that persons involved in acquisition transactions look to their tax counselors for guidance in that area. What do you think those counselors will say about income, tangible personal property and sales and use taxes? How long will they be in practice if they resort to moralisms rather than rigorous legal analysis of the natures and scopes of the various categories, including the relative amounts of taxes due in them?

Professional Pox?

That brings up a phenomenon that particularly requires the attention of all of us. Many computer specialists seem to believe lawyers are afflicted with some sort of professional pox. Your allegory might even reflect a hint of that notion.

For some time, computer specialists have been trying to "go it alone" in a do-it-yourself effort. "C-lawyers" have replaced the "sea lawyers" of the days of sailing vessels and seem to be bent on competing with jailhouse lawyers, but without the disposition of those others to work within the legal system.

It probably is time for a bit more legal humility or sensitivity on their part and a greater readiness to find out how the legal system really works. Those qualities will help to avoid lots of serious grief that otherwise is in store – until you reform the system in your model.

In this regard, I am glad you offered the "License Agreement for IBM Program Products" as a paragon of legal draftsmanship and a model of legal clarity. But even a superficial reading, let alone a careful analysis, of that form indicates to me that, contrary to your opinion, the term "program" *does* mean the media used to communicate the information-processing process or software program to the customer.

The paragraph entitled "Permission to Copy or Modify Licensed Programs" refers to "licensed programs . . . which are provided by IBM in printed form" and to those provided "in machine-readable form." Obviously, the latter are tapes and other computer media.

Since IBM undertakes to secure statutory copyright in the "writings" that reflect the software program, it thereby necessarily focuses in all transactions on the media and documentation as physical items in themselves.

But, as it turns out, its marketing approach is more similar to that of a cartoon syndicator, which furnishes mats and licenses copying by newspapers and other publications, than to a book publisher, which merely sells books and does not give any license to make copies. That's just basic copyright law.

Refer back to the agreement form. Its beginning statement expressly defined the term "licensed programs" to include basic material. As I suggested, the scope of the license granted, which occurs in the section entitled "License," is "to use the licensed program [which, as we see, means basic material] in any machine-readable form.

" 'Use' is defined as copying any portion of the licensed program's [again, read here "basic materials"] instructions or data from . . . media into the CPU for processing." Again, this is just basic copyright law.

Risky Business

Gerry, it seems as if ignoring present legal categories is a risky business. It can cost customers or suppliers real money needlessly or unexpectedly.

As an alternative, I propose developing a sensitivity to applicable legal rules and working with lawyers who are sophisticated about computer technology to apply them properly.

This involves the ability to assess the facts regarding computer transactions and properties accurately in light of the applicable legal rules and the readiness to characterize the facts carefully in written documents to try to achieve appropriate identified legal results. Remember that agreements frequently are scenarios to judges and tax collectors as well as communications means to contract administrators.

I find this type of interprofessional involvement is not only good professional practice but also good, clean fun.

From a Legal Viewpoint

Letters to the Editor

Debugging Suggestions

This letter is in reply to the various letters in *Computerworld* concerning the need for help in debugging Cobol programs, particularly core dumps.

For many IBM OS Cobol systems, the SYSDBOUT DD card, coupled with the "STATE" parameter in the EXEC card, results in an execution-time message which specifically identifies the verb causing the program check.

Also, a number of textbooks already assist in debugging Cobol core dumps, finding the data areas, etc. For IBM OS and DOS Cobol systems, I have found the following book very informative: *Standard Cobol*, 2nd edition by Mike Murach, published by Science Research Associates, Inc., this year.

Chapter 3 of this book shows exactly how to find data areas, DCBs, etc., in a Cobol dump, and although the OS example was not quite complete, most of my first-year Cobol students were able to follow it.

F. William Houghtaling
Raleigh, N.C.

Individual Mystique

Many years ago when I was young and all my programmers had cut their teeth on 1400 absolute, they did debug 360 Cobol from core dumps. Some of them even learned to patch object code and were able to avoid ever fixing source.

However, on my last two machines, all debugging has been from source and the only core dumps were to help the vendor find bugs in the compiler. Naively, I thought that this was progress and that I was doing the right thing.

I have been enlightened by Roger Poole's letter on debugging from core only and Jerrold Asher's contribution on the "programmer mystique" [CW, Nov. 12], each of which gained force by being placed next to the other.

Obviously, to be effective, the mystique must start with the individual programmer so that the manager can use it effectively against the outside world.

D.S. Owings
Brooklyn, N.Y.

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SOFTWARE&SERVICES

User Builds Cobol System to Track Letter Handling

By Catherine Arnst
Of the CW Staff

MADISON, Wis. – Correspondence and requests at a life insurance company here are now assured rapid processing with a software program developed in-house.

"Call-Up" is used to keep track of the more than 3,500 letters that arrive daily at National Guardian Life Insurance Co., Spencer Francis, assistant vice-president and director of systems and data processing, said.

"The 'Call-Up' system helps prevent letters from being misplaced and ensures that requests are answered promptly," he added. "Formerly, they might have been bottlenecked at someone's desk."

The system, consisting of six programs, took the company's seven-person DP staff about a year to develop and has been operating since June.

They received no outside help because "nothing was available to do what we are doing," Francis said. "Call-Up" is written in ANS Cobol and operates under DOS, using under 10K of memory.

Letters arriving at the company are assigned a unique file number and sent to the proper department. That routing is logged into an IBM 370/135.

The department processes the request and returns the letter to the records department with a follow-up date (if necessary) which is also entered into the computer.

A daily list of files requested by all the departments is then printed out so that records can be properly routed.

Another report also lists files required by departments the next day, files needed but not in the filing department (and current location), files in a department more than a week and files inactive for 15 days and ready for deletion.

"Departments don't always return files before the follow-up day, but the system tells us who had it last and how long he's had it," Francis said.

"A folder stays on the 'active' list until the appropriate department completes a transaction and is satisfied that the request is completed."

On-Line System

The system is on-line, so all departments have visual display terminals available with access to policyholders' files. Questions can usually be answered from the information on the terminal without having to locate the physical file.

National Guardian's goal is to respond to letters on either the day of receipt or the following day, Francis said.

An "eight-day" report is generated showing files that have taken more than a week to process and are still open, which goes to department managers so they can pinpoint the reason for the delay.

Other reports itemize number of days required to complete transactions, case load by department and clerk and a list of steps taken in responding to a request.

Problems with the system have been minimal. "It took a long time to get the people comfortable with the system and able to use it efficiently," Francis said.

But "the time savings have been substantial, and it's eliminated huge piles of work," he continued. "It also creates a lot of good will with our policyholders," he said.

Keydata Unveils System Updates

WELLESLEY, Mass. – Business organizations in the U.S. and Canada seeking remote-computing services rather than in-house development have three application systems and a high-speed terminal option from Keydata Corp. to consider, in addition to any other alternatives.

Keydata's Series III services include an on-line financial reporting system, an on-line inventory management system, an on-line accounts receivable system and the high-speed terinal option. Users may pick just those parts of Series III that suit their needs, the vendor emphasized.

Described as an extension of Keydata's accounts payable/general ledger system, the financial reporting service enables users to have "any number" of financial reports designed on a custom basis.

It also provides on-line "what-if" capability for management analysis of such reports, the company added.

The inventory system is said to analyze recent sales patterns and current vendor lead times, together with forecasted sales, to indicate periodically when the user should buy an item and in what quantity.

Use of this system should "sharply increase" a user's inventory turnover, thereby optimizing investment, Keydata said.

The recently announced accounts receivable system "greatly enhances" the capabilities Keydata previously had in this area. It is said to provide users with continuous real-time information of the status of receivables, current with the last transaction entered into the system.

Data can be displayed on a "television-like" screen in the user's office.

Users with high volumes of printouts from Keydata services should be able to cut terminal costs by moving to the new unit Keydata is offering, a spokesman said.

The device prints at up to 120 char./sec, four times faster than units previously available from Keydata.

The higher speed might well mean a user could get all his work done with fewer terminals. Despile the higher cost of the new unit, the net effect could be a significant savings, the vendor said.

Keydata is headquartered at 20 William St., 02181.

DOS Library Routines Mimicked, Outperformed by SDI's 'Fleet'

By Don Leavitt
Of the CW Staff

BURLINGAME, Calif. – Increased program security, simplified program maintenance and faster processing of library control functions are among the advantages cited by Software Design, Inc. (SDI) for use of its Fleet software in IBM DOS and DOS/VS installations.

The SDI package includes programs which match the functions of IBM's CSERV, RSERV, SSERV, MAINT and LNKEDT routines, but with "10 times faster performance," the vendor said.

Fleet also includes features not found in the standard IBM service programs, the spokesman added.

Fleet programs, for example, carry out "extensive" security checks to minimize the chance of defective libraries being handled and provide warnings – which the operator cannot easily bypass – if libraries are inadvertantly damaged.

Equally important with speed and new capabilities, however, is Fleet's ability to provide these enhancements while working with IBM standard libraries, SDI said.

All components, therefore, remain accessible to the standard IBM support programs – if there is ever any question about Fleet's processing – and source statement books can be retrieved by the DOS or DOS/VS compilers.

Existing jobstreams using the standard service programs produce identical logical results when converted to use Fleet, the vendor added.

Fleet programs produce output that is in standard unblocked, 80-column output or optionally in 1,600-byte blocks on magnetic tapes with standard labels.

Support for moving disk files to tape, including the dropping of all deleted records, not only provides fast backup/restore capabilities, but support conversion from one type of disk to another, the spokesman added.

Fleet incorporates an enhanced version of SDI's previously available Fmaint package. Though Fmaint itself will no longer be newly installed, technical support for existing users will continue.

Fleet costs $225/mo, which would result in a typical net savings of just over $1,000/mo compared with the cost of using IBM-provided programs, according to an SDI calculation.

SDI is at 880 Mitlen Road, 94010.

'Robot' Eases Links With DBMS

KENSINGTON, Md. – While a number of report generators have been interfaced with data base management systems (DBMS), a software product called 'Robot' appears to go even further.

It translates English language requests into terms a DBMS can handle and translates the DBMS's response into English, according to the vendor, Artificial Intelligence Corp. (AIC).

Robot is compatible with any computer that has PL/1 run-time support, including IBM 360/370s, and "can be used to drive all commercially available DBMS," the company said, noting that most of its demonstration runs have used Software AG's Adabas.

The package is a pre- and postprocessor designed to allow clerks and managers from user departments to express what they are seeking from the data base in their own terms rather than in the somewhat restrictive terms of a computer language.

Robot includes a dictionary which leads into the user's data base, a transition network grammar and a semantic interpreter. With this combination of tools, Robot parses the user's English request and maps the formal representation into the syntax of the DBMS command language.

The DBMS works with the data, determines the answer to the request and turns it over to Robot, which in turn converts it into English and displays it on a line printer or CRT-based terminal.

The user's DP department or data base administration staff is likely to help in creating the dictionary and semantic interpreter within Robot.

Therefore, the system is able to work out implicit linkages to data fields even when they have names different from the ones used in the request and even if qualification phrases are not absolutely as expected.

Designed to run in 140K bytes without overlays or 80K with them, Robot can be acquired for a one-time fee of $30,000 or $1,300/mo for two years.

It is also available on the Computer Network (Comnet) Corp. remote-computing network, an AIC spokesman said from 3514 Flyers Mill Road, 20795.

Musing of a DP Manager



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Interdata Multitasks 16-Bit Minis

OCEANPORT, N.J. – A multitasking operating system called OS/16 MT2 – from Interdata, Inc. – is said to optimize the use of the minimaker's 16-bit machines in real-time, program development and computational applications.

Upward-compatible with Interdata's OS/32 MT for its 32-bit machines, OS/16 MT2 is said to combine the major features of operating systems previously available for the 16-bit minis. It combines a command substitution system, multiple shared libraries, round-robin scheduling and file protection conforming to standards of the Instrument Society of America, Interdata said.

The control software includes task, memory and file management and convenient user interfaces, the vendor claimed.

User-written tasks with as many as 256 priorities are supported by the task management features. Intertask communications and task-handled traps are also provided.

Memory management is said to include a task establisher utility, partitioned memory, roll-in/roll-out and multiple overlay facilities. File management provides indexed and contiguous files and file protection.

The utilities include an edit routine, unspecified operating system aids, a library loader, copy capabilities and Itam/16 for data communications.

OS/16 MT2 is resident in 16K bytes of memory, supports all Interdata peripheral equipment and is available on cards or magnetic media.

Already released to selected field installations, it will be available for general distribution next month.

OS/16 MT2 carries a one-time charge of $1,400, Interdata noted.

Throughput Jumps, Costs Drop With Relational View of Data

By Joseph W. Schmitt
Special to Computerworld

GLEN ELLYN, Ill. – By adopting a relational view of data, Datad Corp. has cut its software costs, increased throughput, cut new development time to a fraction of its former span and cleaned up some fuzzy thinking in the process.

During 1970 and 1971, Datad found it was paying too much for software applications development. A large part of each project was devoted to defining file formats, writing the corresponding program code and writing specialized utility programs to edit, correct and otherwise manipulate the formatted data sets.

An in-house program was launched to develop a universal data set/program interface and provide one master set of utility programs for all data sets.

By mid-1971, the interface was working, and as much as 90% of the effort formerly required in developing new applications had disappeared.

The interface now handles all external data sets in Datad's system with several beneficial consequences:

- A single set of sophisticated utility programs now handles all data management, updating, rearranging, perusing, correcting, controlling, etc. for all present and future datasets. Functions such as FIND, MOVE, PRINT (selected items), SET, CREATE, etc. are invocable from an interactive terminal.
- Data sets can be dynamically redefined without upsetting any programs.
- Redundant code of nearly all I/O functions has been eliminated. Programming a new application consists almost wholly of writing the logical steps of the application.
- Analysts pass the data definition stage of an application much more quickly than in the past because data elements can be added or deleted without calling for reprogramming.

Transparent to User

File formats and storage locations are transparent to the user. All data is stored and referenced in named tables with named columns. All names are defined and assigned by the user.

The system has inquiry, computational and report-writing capabilities. It has been used to do sales forecasting, order entry, corporate accounting, financial statements and investment portfolio recordkeeping and reporting.

With hindsight, Datad realized in 1973 that this is a full-fledged data base management system (DBMS) although that was not the original goal.

Specifically, it is a relational DBMS, because the original interface was designed to handle tables of data with named columns.

Each column in a table is a set of fields for a specific data element; and each row of data is an aggregate of data element values representing an item or an event.

Early apprehensions over possible limitations imposed by viewing all data in tabular form have evaporated. No application has yet been found which could not be handled, and in more than one instance an application has actually been enhanced by the discipline imposed upon it during the tabularizing process.

The theoretical work of E.F. Codd at IBM on relational data bases lent further support to Datad's assessment of its own experience. Access path anomalies and certain data deadlocks are eliminated.

Datad's system is written in PL/I and implemented on the Service Bureau Co.'s remote-computing network under the Call/370 service.

Schmitt is president of Datad Corp.



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'Adabas' Subsystem Aids BOM Processing

RESTON, Va. – Bill of Materials (BOM) processing built on files under the Adabas data base management system is supported directly by the Adabas Bill of Materials (Adabom) subsystem available from the Adabas vendor, Software AG.

Calls to Adabom allow the user to access and maintain pertinent files without creating retrieval and update logic in each application.

The user's BOM data base may contain any number of interrelated files, Software AG noted, but two are essential: one on product structure, the other on parts.

Adabom logic is provided free for now to any user of the $120,000 Adabas software, the vendor noted from 11800 Sunrise Valley Drive, 22091.

'Not Just Another Product'

DBMS Forces Change in Approach to Problem Solving

By Nancy French
Of the CW Staff

TORONTO – Data base systems are much more than just another software product, they represent a completely new way of developing systems, according to Pat Nichols, manager of data base/data communications services for Datacrown Ltd.

Data base requires a new philosophy – a new way of organizing data, a new way of designing applications and a new role for end users, she said.

Rather than basing inputs and systems on the type of outputs the user needs, which is the approach taken by the traditional systems developer, the systems analyst's first step under data base is to identify the data that is needed to solve the user's problem, she explained.

Once that is defined, the systems analyst determines how much of that data is currently available in the company's existing data bases.

Then data not currently available will have to be captured, not as part of any given application system, but rather as part of the company's data maintenance system to be used for all applications, she explained.

Two Types of Systems

There are really two types of systems in a data base environment: data maintenance systems, which process transaction inputs and update data bases for shared use, and information systems, which utlize the data available to produce the outputs required to satisfy user requirements, she said. There is no direct relationship between these two types of systems, she added.

In a data base environment, data bases will be designed based on "entities" within the business creating "families of data" conceming such things as employees, products or customers, for example. This data will serve all applications, she explained.

"There is a one-for-one relationship between data bases and systems; this is completely different from a conventional approach where files are designed to serve a single application."

Traditional systems development requires that transaction inputs be designed for a single system, with data often collected more than once to satisfy several systems.

"Now, inputs actually have a value of their own," she emphasized. Under the traditional approach, considerable data redundancy can be found between files.

Systems are designed for individual efficiency rather than for general efficiency.

Further, because the user has but one chance to specify his needs for a system he knows he must live with for four or five years, he asks for the moon, Nichols said.

Data base eliminates all these shortcomings and offers other advantages as well, she said.

Query languages and report writers provided as part of DBMS software handle many chores, eliminatlng the need for new application programs, she said.

In addltion to dramatically reducing application development costs, these facilities reduce the need to predefine specific outputs and permit many requests to be handled on an ad-hoc basis, she noted.

Data Basics

Difficult to Quantify

Most companies will want to make the decision to move to data base management systems (DBMS) based on a cost-benefit analysis, she said, but "while the costs are quite clear and can be quantifled, the benefits are largely dependent on the particular DBMS and are difficult to quantify.

At the conclusion of her presentation at the recent Canadian Computer Conference, she warned that, in addition to assessing the cost and benefits, there are many pitfalls of which a company must be aware.

First, technical support costs are usually underestimated. Supplementary software products are often required with many DBMS, she added.

Further, there is a shortage of personnel skilled in this new approach. Also, most vendors cannot predict operating costs in advance of implementation, and, finally, the DP department often finds itself diverting resources from application development to supporting the software, she explained.

'Utotal' Reorganizes, Reloads Data Bases

MILWAUKEE – IBM OS/VS installations using Cincom Systems' Total can load, unload or reorganize data bases through simple keyword control cards with the Utotal utility package from DASD Corp.

When more space is needed, DASD explained, Utotal may be used to unload a data base and then reload it under a new DBGEN. When used as a regular backup/restore facility, Utotal reduces both CPU time and disk space because only active records are copied, the vendor continued.

Access efficiency is improved after Utotal is used to reorganize Total variable files, a spokesman claimed. The reorganization process puts these files in physical and logical sequence and places records having the same Primary Chain within the same physical block.

The keyword parameters used to activate Utotal capabilities are in a format consistent with IBM's OS/VS utilities.

Requiring 48K bytes of memory, Utotal is delivered in object form for what the vendor called a "bicentennial price" of $1,776.

DASD Corp. is at 8707 N. Port Washington Road, 53217.



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Its variety of data placement techniques, its unrestricted facilities for logically relating all data under its control, its provision for an unlimited number of databasc entry points, and its superior space management approach amounted to both a substantial performance edge and a flexible database architecture advantage.

With data independence established by means of separate schcma and subschcma compilers, we realized that many applications programs would no longer depend on data definitions they themselves employed.

From a programming point of view, the system was miles ahead of its competition. Example: IDMS's DML processor inserts all necessary data record descriptions directly into thc user's COBOL program and allows use of database-oriented verbs, such as FIND, OBTAIN, or STORE.

We were pleased to find that IDMS is the only system currently running on IBM (OS and DOS) and Univac Spectra equipment that corresponds to the CODASYL DBTG specification of April 1971. Machine independence is always an important consideration, and IDMS represented the perfect answer to that issue.

Also, the IDMS/CULPRIT rctricval systcm; running from the same data definitions that the user established to create his database network, provides unlimited database access facilities for reporting purposes.

We found the documentation was beautifully done – complcte and well-presentcd. The users we contacted were most enthusiastic about thc system and confirmed what we'd heard – that the Cullinane Corporation has an outstanding reputation for support.

If you're serious about Database Management you have to look seriously at IDMS.

Write or phone for a tcchnical brochure or call me, William Casey, and if my travel schedule permits, I'll personally show you exactly how :ve compared the various choices and why we picked IDMS. You see – I liked IDMS so much I joined thc Cullinane Team.

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Pinpointing Problems—Part I

SMF Data Valid for Billings But Bad for Measurement

By Aso Tavitian
Special to Computerworld

According to IBM's manual, GC35-0004-5, System Management Facilities (SMF) is "a feature of OS/VS that provides the means for gathering and recording information that can be used for billing customers or evaluating system usage."

Customer billing, one of these functions, requires repeatability and accurate measurement of the resources used by a given job/step.

Performance Evaluation

How well the wealth of information gathered by SMF is used to prepare customer's bills depends on the sophistication of an installation's accounting system as well as the degree of inaccuracy deemed acceptable by the installation.

Since SMF provides incomplete or inaccurate information about the use of some resources (e.g., CPU time, channel time), particularly on the job/step level, it is often necessary to sacrifice some accuracy or completeness for the sake of repeatability.

Evaluating system usage, the other major function of SMF, requires closer examination. The SMF manual discusses how information gathered by SMF might be "used to measure system usage against departmental standards of efficiency and performance."

SMF does provide information which can be used to draw some conclusions about efficiency and performance; however, SMF leaves much to be desired as a performance measurement tool, particularly on the job/step level.

The most frequently measured parameters when the performance of a program is examined are elapsed time, CPU time, channel time, device-busy time and disk-space utilization.

The total CPU time of a program consists of two components: problem state and supervisor state.

SMF provides a number of different record types with its own format and purpose. Record Types five and four contain information about the CPU utilization of a job/step respectively. This information, referred to as "CPU time" in the SMF manual, is printed at the completion of each job/step and is labeled "CPU" on the outputs produced by the system.

This SMF-recorded time contains the entire problem-state CPU time and a fraction of the supervisor-state CPU time. Thus, it does not accurately represent the true total CPU utilization of a job/step.

Erroneous Conclusions

Since the fraction of the true CPU time it represents varies not only with various system configurations, but with programming techniques as well, the use of the SMF-recorded CPU time for measuring CPU utilization can lead to erroneous conclusions.

This would be particularly true for programs which have high supervisor-state CPU time. For instance, the significant amount of supervisor-state CPU time used for translating the CCWs when ECCP instead of EXCPVR is used in a VS environment will not be reflected in the SMF-recorded CPU time.

Thus, the true total CPU time of a program issuing many I/O operations in a VS environment and not using EXCPVR will be much higher than the SMF-recorded CPU time. IBM's reason (given in private correspondence), for the inaccuracy of the CPU time reported in SMF is the attempt to make SMF "somewhat reproduceable."

In addition to collecting CPU time in record Types five and four, SMF collects the CPU wait time in record Type one. "This record," explained the SMF manual, "is written at SMF initialization and at first job/step termination following the expiration of a 10-minute interval of elapsed system time. It contains the CPU wait time accumulated during all of the 10-minute intervals that expired between two step terminations."

If a program was executed in a dedicated environment and the CPU wait time accumulated for the duration of the job/step was known, its total CPU time can be calculated by subtracting the CPU wait time from the elapsed time.

However, SMF does not record the CPU wait time in relation to a particular job/step. As already mentioned, it is accumulated for one or more 10-minute intervals.

Thus, a Type one record may contain CPU wait time corresponding to the program whose total CPU time is being measured as well as some CPU wait time accumulated prior to and subsequent to the execution of the program.

To determine the portion of the CPU wait time accumulated during the execution of the program, the rate at which CPU wait time is accumulated prior to and subsequent to the execution of the program would have to be known.

A further complication arises when the CPU wait time corresponding to the program is spread over two Type one records. Termination of the program will trigger creation of the first Type one record.

Creation of the second Type one record can be triggered by executing a short test job (e.g., IEFBR14) 10 or more minutes after completion of the program. Again, the rate of CPU wait time accumulation during these 10 or more minutes would have to be known.

If additional measurements are to be made, the CPU wait time of the test job will appear in subsequent Type one records combined with the CPU wait time of the next measurement.

To separate the CPU wait time for subsequent runs, the CPU wait time accumulated during execution of the test job would have to be known.

In short, while SMF's Type one records can be effectively used to measure the CPU usage of an entire multiprogramming system for a period of a few hours, they are unsuitable for measuring the total CPU usage during the execution of a short job/step. The use of record Type one for such purpose would be particularly unfeasible when the total CPU time of 20 to 30 different jobs (not unusual for a thorough evaluation of two products) is required.

The underlying reason for the difficulty is that SMF's record Type one was never meant to be used in measuring the total CPU time of an indiviudal program.

In Part 2, Tavitian will outline SMF's handling of channel time, device-busy time and disk-space utilization.

Tavitian is president of Whitlow Computer Systems, Inc., in Englewood Cliffs, N.J.

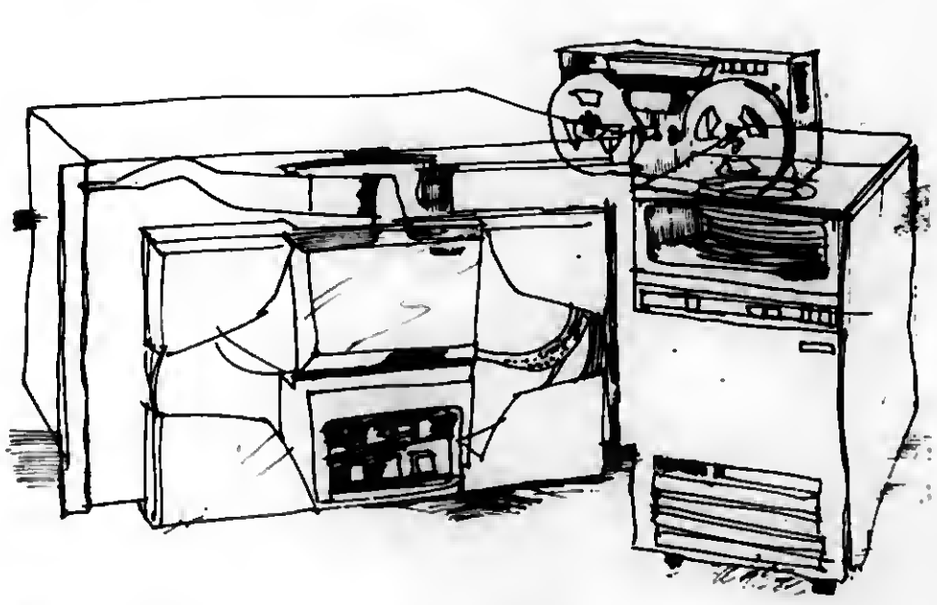
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COMMUNICATIONS

Vendor Keeps Operating Histories

Maintenance Center Keeps 700 Terminals on the Air

By Ronald A. Frank
Of the CW Staff

NASHUA, N.H. – A maintenance control center at Sanders Data Systems is helping to keep more than 700 terminals and other equipment at 300 customer locations on the air.

The center uses a self-contained Sanders 8100 DP system to maintain a data base of about 2,000 records on the operating and maintenance history of each terminal in the field.

Most of the calls coming into the maintenance center are related to equipment problems but, as an operational history is built up on each device, it is possible to anticipate malfunctions and perform preventive maintenance, according to Dave Hendricks, supervisor of field engineering support.

The control center began operations in 1973 with only a few terminals to monitor. Today it maintains close contact with 50 Sanders field offices, in addition to the customer sites.

In the past year, there has been a significant drop in the amount of service calls per month. Hendricks attributed this to the preventive maintenance initiated by the control center.

One year ago the rate of service calls was about 450 per month while it is now about 300 per month. And this reduction has taken place despite the fact that an ever-increasing amount of equipment is being tracked by the center.

The net result of this improvement is that the company is now keeping more equipment operational a greater amount of time with fewer field service representatives, Hendricks said.

The center attempts to achieve an average response time of four hours for trouble calls originating from customer locations that are within 50 miles from the nearest Sanders field maintenance office. In some cases, when a customer calls into the center on the toll-free In-Wats lines, one of the operators can help solve the problem on the spot.

If this is not possible, the nearest field office is alerted and the problem is described. A maintenance representative is then dispatched to the site and the center is contacted when the representative arrives.

All repair and maintenance data is logged onto Sanders 860 CRTs at the center and the information is then entered into the data base. In the event of serious problems, the operators at the center can put the field representative in touch with engineering specialists at the main Sanders facility here.



CW Photo by R. Frank

Carol Kerr, group service coordinator, logs in terminal trouble report.

The engineers then work directly with the representatives at the customer site, but the operation continues to be coordinated by the control center. All pertinent data continues to be logged into the files of the equipment that has malfunctioned.

Network Maintenance

For larger customers with nationwide networks, the Sanders center is connected directly into the system. In one such case,

(Continued on Page 20)

Codex LSI Modems Feature 'Gearshift' Capability

NEWTON, Mass. – Codex Corp. has introduced a line of eight LSI modems, designed for high-speed applications, that feature a "gearshift" capability which allows equalization at a lower speed followed by an automatic shift up to a higher transmission speed.

Diagnostic and monitoring features have also been expanded in the LSI modems, Codex said.

For point-to-point applications, the LSI 9600, LSI 7200 and LSI 4800 operate at 9,600-, 7,200- and 4,800 bit/sec for full-duplex operation over Bell 3002 or equivalent voice-grade lines. These units have compatible modes that permit on-line operation with the earlier Codex 9600C, 7200C and 4800C modems, but are said to have higher performance and enhanced diagnostic features.

The point-to-point models have improved automatic equalizer operating performance and a wider range of fallback speeds, the firm said.

In multipoint applications, the LSI 96FP, LSI 72FP and LSI 48FP Fast-Poll Multipoint units provide 9,600-, 7,200- and 4,800 bit/sec speeds on the outbound master side in polled networks.

An inbound automatic gearshift mechanism permits inbound poll responses to begin at 2,400 bit/sec and automatically shifts both master and slave modems up to 4,800 bit/sec if the length of the response message makes the use of that higher speed necessary.

The result is a 9 msec response time for all messages with an effective inbound throughput of 4,800 bit/sec. Line equalization can be accomplished in 27 msec at 2,400 bit/sec compared with 50 msec at 4,800 bit/sec, a spokesman said.

The LSI 48I international model operates at 4,800 bit/sec and is compatible with CCITT V.27 specifications. Strap selection of standard fast train modes also provides multipoint operational capability.

The LSI 48D 4,800 bit/sec dial-up model has an initial equalization time of 180 msec and 50 msec line turnaround for operation in half-duplex, two-wire configurations.

The LSI series' network management capabilities include the Circuit Quality Monitoring System (CQMS) and the Multipoint Network Control System (MNCS).

The CQMS will cost "under $5,000" and combines five different network monitoring and diagnostic functions, Codex said.

The MNCS provides system monitoring, diagnostic and reconfiguration capability for use with Codex LSI multipoint modems in dedicated polled applications.

Prices for the point-to-point units start at $8,500 for the LSI 9600, $6,500 for the LSI 7200 and $4,325 for the LSI 4800, with two-year leases at $185/mo, $150/mo and $95/mo respectively.

The multipoint models cost $8,750 for the 9600 FP, $6,725 for the 7200 FP and $4,500 for the 4800 FP. Two-year lease rates are $200/mo, $160/mo and $105/mo.

First deliveries of the point-to-point models are scheduled for the first quarter of 1976. The multipoint modems will be available in the second quarter from 15 Riverdale Ave., 02195.

Recession Not Affecting Salaries

NEW YORK – The recession has had no noticeable effect on the long-term upward trend in salaries being paid to telecommunications specialists, an annual telecommunications salary survey done by Personnel Resources has found.

The typical telecommunications employee received an increase of about 10% so far this year, which was not enough to keep pace with current inflation rates. But those in the $20,000 and over category probably received a smaller percentage increase and also had greater difficulty in finding new employment, according to the survey.

Those in the over $30,000 bracket found few openings during the year, the survey showed.

Among the specialists "in very short supply" are engineers with data transmission and microprocessor experience and real-time message-switching programmers. The survey said there are "multiple openings" for corporate telecommunications analysts and managers at the moment.

Salaries for message-switching programmers range from $13,000 to $16,000; for senior telecommunications programmers they range from $15,000 to $19,000, the survey found.

Communications managers were listed in the $19,000 to $27,000 range. Analysts with some data communications experience had a salary range from $15,000 to $19,000.

Salaries in the New York City area were somewhat higher than national averages in all categories.

Personnel Resources said the salary information represents the "mid-50% of data" which it collected from about 800 persons working in the telecommunications area. Copies of the survey are available from the company at Suite 1234, 342 Madison Ave., 10017.

Datapro Salutes the Software Winners!

Here are the top 25 software packages out of 1,400 as determined by user ratings in Datapro Research Corporation's 1975 survey of 26,000 computer system users.

1975 Datapro Software Honor Roll

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ASAP Universal Softwere, Inc.
Disk Utilities Westinghouse Electric Corporation
DYL-250 Dylekor Softwere Systems, Inc.
EPAT Softwere Design, Inc.
Fast Dump Restore Innovation Data Processing, Inc.
Foresight Foresight Systems, Inc.
1130/FORTRAN DNA Systems, Inc.
GRASP Softwere Design, Inc.
IMSL IMSL, Inc.
KOMAND-DAS Pace Applied Technology, Inc.
The LIBRARIAN Applied Data Research, Inc.
Optimizer/Optimizer II Cepex Corporation
PAN*SORT Pensophic Systems, Inc.
PANVALET Pansophic Systams, Inc.
PPE Boole & Babbega, Inc.
Quikjob I, II, & III Systam Support Software, Inc.
RELO-PLUS Univarsal Softwara Inc.
RPG II IBM Corporetion
1130/SORT DNA Systams, Inc.
SYNCSORT Whitlow Computar Systems, Inc.
UCC ONE (TMS) University Computing Compeny
UCC TWO (DUO) University Computing Company
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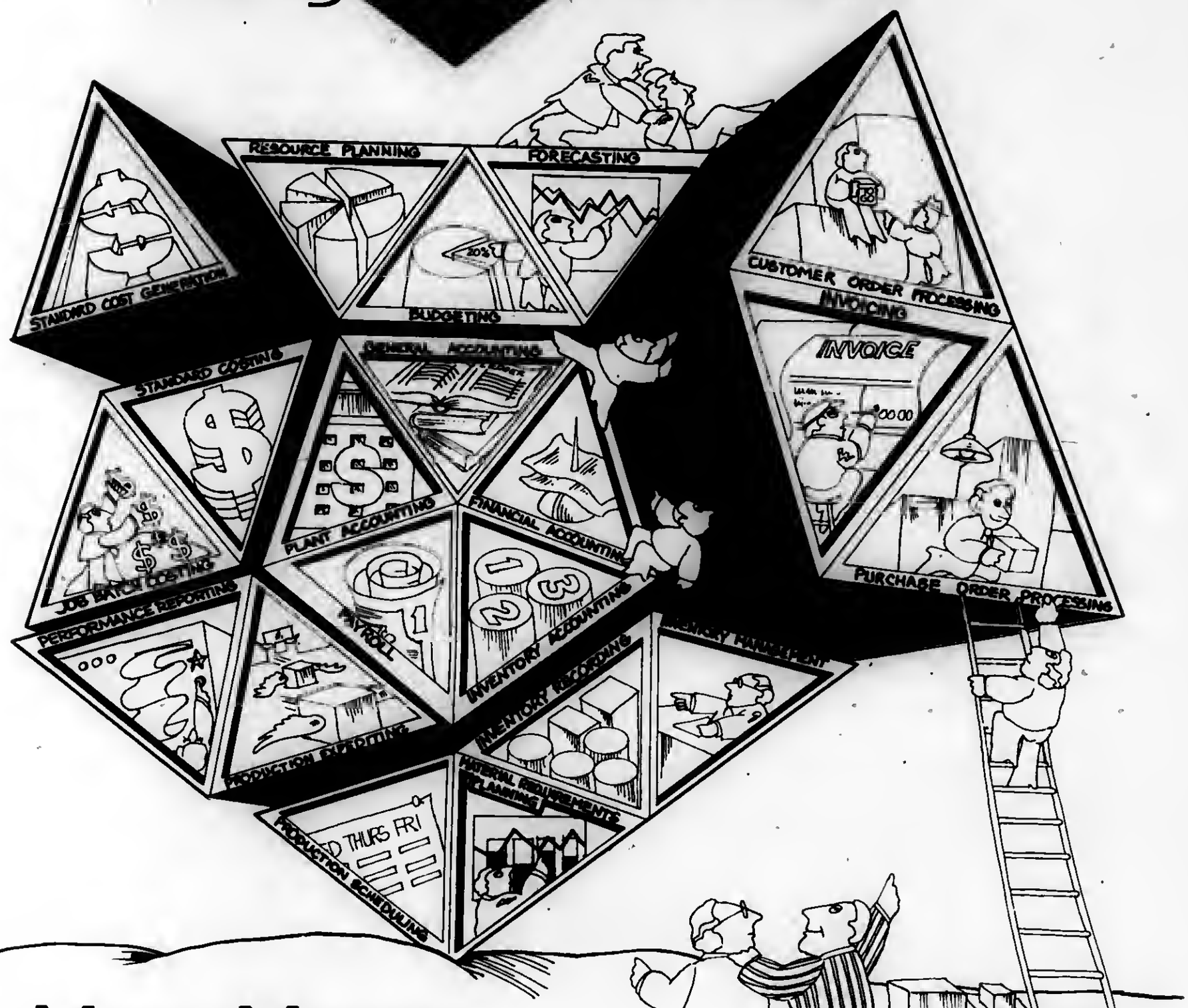
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		Weeks	Weeks
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Cost Control	25	2	10
Order Control	34	2	10
Manufacturing Control	60	2	12
Financial Control	176	3	15
Business Planning	45	2	10
	510	2.3 Average	12 Average

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failure to produce results, subsequent temperamental behavior. The MMDS MAS range was built in 1967/1968, with a completely new Version 2 released in 1972/1973. You know the systems will work; that they'll produce the results; and that the anticipated interaction will be there when you want it. You know the input documents are usable, the controls extensive and the reporting responsive to your needs. And you know the systems performance has been honed to a fine edge in the 500 implementations; the customizing facility giving nothing away in performance or fit.

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Center Keeps Terminals Running

(Continued from Page 17)

the control center, has a terminal on the Titan administrative network operated for the Teamsters Union.

The operators at the center can communicate directly with the main Titan facility when problems arise. The Titan net is operated under a facilities management arrangement by the Data Transmission Co. for the union, and the Sanders unit provides the maintenance data for the CRTs in the network.

The maintenance data base is stored on a disk drive in the 8100 Sanders controller. In addition to the two 860 CRTs, the system includes a printer used to issue regular summary data of the maintenance operations.

Copies of these summaries are sent to the field offices as well as to Sanders' engineering department, Hendricks said.

As an adjunct to the control center, engineering maintains six 860 CRTs to do on-line diagnostics with malfunctioning terminals in the field. When serious problems occur, the field representatives at the customer site use dial-up lines to transmit diagnostic information back and forth to Nashua at 2,400 bit/sec.

The maintenance data base uses in-house IMP software and the system is housed within the 5M-byte disk subsystem on the 8100 controller.

The control center operates 12 hours per day although it is never fully shut down. When operators are not on duty, all In-Wats trouble calls are logged onto a recording device which is checked once each hour until the center reopens.



CW Photo by R. Frenk

Terminal control center keeps repair data base.

FCC Gives Nod To WUI Service

NEW YORK — Western Union International, Inc. (WUI) has received approval from the Federal Communications Commission (FCC) to furnish International Digital Data Service (IDDS) to France, Italy, Spain and Austria.

IDDS is a digital service which will feature simultaneous transmission of data over both satellite and undersea cable circuits.

Citing "advantages" and "potential benefits," the FCC ruling called for a one-year experimental service. Before service can begin, WUI must file its tariff detailing rates and service terms.

A WUI spokesman estimated IDDS service could begin by mid-1976 after plans are finalized with telecommunications authorities in the initial four countries.

Entrex Package Allows Emulation

BURLINGTON, Mass. — Entrex, Inc. has released a communications software package option which allows all Entrex systems except the 280-I to communicate with a wide range of binary synchronous communications devices, a company spokesman said.

With the Data Comm parameterized communications option, the user may configure his system to emulate almost any device adhering to general binary synchronous line protocol, the spokesman added.

The option allows high-speed communications to be performed concurrently with data entry, preprocessing and formatted report generation at the source of data, he added.

Data/Comm's features include spooling, unattended operation, expanded buffer/record size, data transparency, data compression and multipoint support.

Using the package, the Entrex user may configure his system to emulate most binary synchronous devices, including IBM 3780, 2780, 2770, 3741, 3747 and 2698 models, the company said.

The Data/Comm package is available immediately from the company at 168 Middlesex Tnpk., 01803.

The uncompromising MS88 from Tesdata.



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NCR Expands 796 Series

DAYTON, Ohio – NCR Corp. has expanded its 796 series of display terminals with a CRT that features upper- and lower-case characters, multiple transmission speeds and the ability to insert or delete lines of information.

The NCR 796-401 Block/Conversational CRT terminal can be used as a direct replacement for a teletypewriter. It provides faster transmission speeds, local editing and the use of graphics, NCR said.

Through a selection switch, the terminal can operate at 110-, 300-, 1,200- and 9,600 bit/sec.

A total of 1,920 characters in 24 lines with 80 char./line can be displayed on the 12-in. screen.

Printers can be attached to the basic terminal.

The NCR 796-401, available immediately, can be purchased for $3,100 or leased for $130/mo.

For Time-Critical Application

Bank Uses Batch Units in On-Line Net

BOSTON – While many organizations today are moving from batch processing to on-line computing, State Street Bank (SSB) here recently combined the advantages of each to produce a batch-entered, on-line terminal network.

The rationale for this system lies in the time-critical nature of the handling of millions of dollars in securities transactions which must be recorded daily by the Custodian Services Department, according to Jack Robinson, assistant vice-president.

The department has to ensure its mutual fund customers prompt daily reporting of current net asset value to the National Association of Securities Dealers for publication by the daily news media.

To handle the transaction volume, the bank installed Sycor, Inc. Model 340 and Model 350 batch terminals in an on-line network.

The Securities Pricing and Recordkeeping (Spark) system produces a variety of daily and monthly reports such as transaction journals and appraisals as well as a wide range of accounting reports including sales and purchase journals, investment ledgers, corporate action reports and dividend/interest receivable journals.

Terminal Transactions

The bank's growth in the custodial area has been significant in recent years. As SSB's Custodian Services Department began to handle more clients, its transaction volume increased and the demand for on-line computing time grew as well.

"The increase in transaction volumes placed extremely heavy demands on the existing on-line terminal network as well as our keypunch facilities.

"We also found our on-line response time was beginning to show signs of degradation. The IBM Selectric typewriter terminals were not fast enough to handle the increased traffic.

"It was this increased volume which eventually led to the replacement of our on-line terminal network with intelligent terminals operating on-line," Robinson explained.

Other Problems

There were other problems too, A.E. Atlison, SSB's senior vice-president, noted. "When you wanted to make a change in the on-line program it was usually a massive undertaking. We can now program these intelligent terminals to do many of the same editing functions at reduced time and cost."

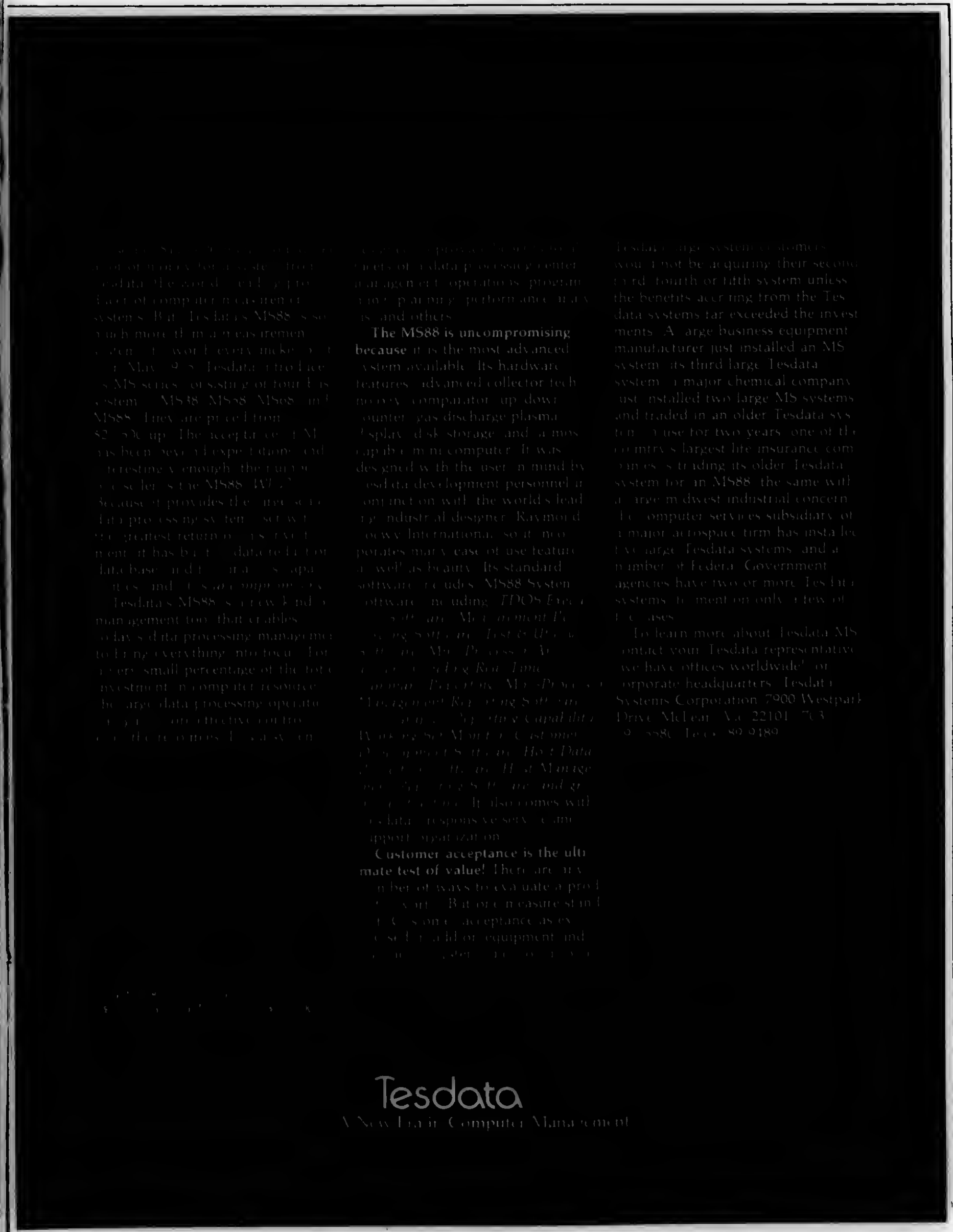
Currently, 12,000 trade transaction/mo are entered on Sycor Model 340, Model 340 with dual diskette options and Model 350 intelligent terminals. The data, received by TWX, phone or mail from the individual funds or fund traders, is entered via the terminals and, at intervals, transmitted to the company's IBM 370/155 mainframe operating under OS/MVT for processing.

The terminals also are able to receive information from the 370 over the same phone lines used for transmission.

The terminals now perform a variety of edits and checks ones that were previously done on-line by the CPU, including check-digit verification on account numbers, "must-fill" features, batch balancing of total shares and price per share and other arithmetic calculations.

The terminals' editing capabilities were a prime factor in their ultimate selection because SSB not only wanted to upgrade its daytime on-line network, but also saw the possibility of replacing its keypunch operation, which did night-time duty.

"While we weren't doing it specifically to save money, we were able to save with the wholesale replacement of both our on-line terminals and keypunching by one single device," Robinson said.



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Editing Recorder Micro-Driven

SUNNYVALE, Calif. – A microprocessor-driven editing recorder which handles data preparation, word processing and teleprocessing tasks has been announced by Anderson Jacobson, Inc. (AJ).

The AJ 730 combines a Philips-type cassette tape drive with control electronics in a desk-top console.

Using the AJ 730 in an off-line mode, an operator can record data or text, use search and edit line features to correct and update previously entered material and print as many copies of data or text as desired, the company said.

On-line, the recorder is equipped to operate as a store-and-forward device and as the central unit in an automatic data collection network.

Although primarily designed to interface with AJ's own terminals, it may also be used with other terminals or in networks of mixed terminals. The unit automatically provides the correct terminal protocol (for example, Ascii, Selectric or Teletype) and can differentiate among data transmission rates of 110-, 135-, 300- or 1,200 bit/sec, AJ said.

The AJ 730 leases for $85/mo with a purchase price of $2,850, the company said from 1065 Morse Ave.

CCI Upgrades CC-70 With CC-80 Features

TORRANCE, Calif. – Users of the CC-70 communications processor system from Computer Communications, Inc. (CCI) can upgrade their systems to attain the processing power and capabilities of CCI's CC-80 system, according to the vendor.

The CC-70P provides increased throughput and reliability by using MOS semiconductor memory and features of the CC-80 processor. It can be installed in the field with a minimum of system downtime, the firm said.

Software Compatible

The upgraded system is fully software-compatible with the CC-70 and is adaptable to CCI's computer communications software products.

A typical price for upgrading to a CC-70P is $35,000. First installations will be made in January, CCI said from 2610 Columbia St., 90503.

Teleprocessing's Simulator Replaces Pair of Modems

LOS ANGELES – Teleprocessing Products Co. has designed a modem simulator to replace a pair of synchronous or asynchronous modems in local, short-haul applications.

The Model TP-232 features selectable data rates up to 19.2 kbit/sec, digital loopback and the ability to regenerate an RS-232 interface beyond a 50-ft limit, according to the firm.

The unit may be used in either continuous carrier or polling systems or as a synchronous clock source for testing synchronous time-division multiplexer (TDM) channels.

Purchase price for the TP-232 is $500, the company said from Suite 101, 11110 Ohio Ave., 90025.

ISI Has 4165 Alternative For IBM 328X Printers

ANN ARBOR, Mich. – Interface Systems, Inc. (ISI) has introduced a higher speed, plug-compatible replacement for IBM 328X printer models 1 and 2.

The Model 4165 printer interfaces directly to IBM 3271 or 3272 control units and is therefore unaffected by software changes, according to ISI.

The 4165 uses a 9 by 7 dot matrix and delivers a 165 char./sec printing speed. Additional features include vertical format control, elongated boldface characters for highlighting and forms handling.

The printer also has automatic new line code recognition in unformatted mode, and head travel stops at the last printed character in formatted mode, ISI said.

Unit cost of the 4165 is $6,750; purchase and lease plans are available, ISI said from 5 Research Drive, 48103.

ICC Booklet Rates Modems

MIAMI – A booklet from International Communications Corp. (ICC) compares the firm's Model 24 LSI modem with the AT&T Dataphone 2400 data set.

The 16-page booklet includes a comparison of pricing policies, line turnaround time and features such as reverse and secondary channels and diagnostics.

Copies of the booklet are available at no charge from 8600 N.W. 41 St., 33166.

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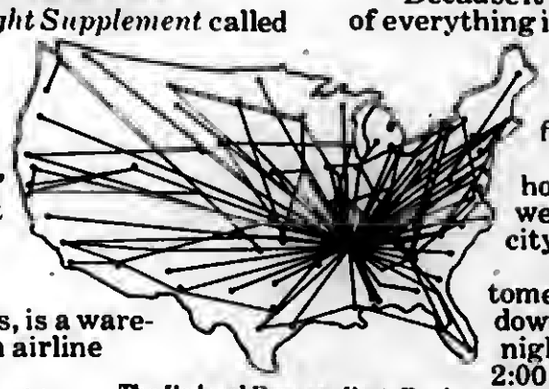
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NCR Hiking Century Rates

DAYTON, Ohio – NCR Corp. will raise maintenance and rental prices for most NCR Century series computers and associated peripherals on Jan. 1.

Monthly rental rates, which include equipment maintenance, will be raised by from .5% to 2.5% on most Century series computers. Rental rates remain the same, however, for the Century 151, 251 and 300.

Monthly rental rates for most Century peripherals will rise 1%. Excluded from the increase are the NCR 657 and 658 disk subsystems, the NCR 636 magnetic tape cassette reader, Century communications equipment and processor features.

For purchased computer systems, maintenance rate increases will range from 1% to 10%. The increases apply to all Century computers except the 151, 251 and 300.

Maintenance rate increases for purchased peripheral equipment will average 8.5%. However, the rates remain the same for the NCR 657 and 658, the 636, Century communications equipment and processor features.

Goes to Third-Party Leasing

Firm Gains Performance in Economy Move

By Patrick Ward
Of the CW Staff

GREENE, N.Y. – "We wanted to reduce costs, but do it without cutting horsepower. We were able to do that and then some by making a DP economy move," according to Bill Fairbanks, a systems programmer for the Raymond Corp.

Raymond Corp., a manufacturer of narrow-aisle electric lift trucks and semiautomated warehousing systems, faced a budget crunch last spring. At the same time, its DP department was running out of IBM 3330 disk capacity on its 128K IBM 370/125 running under Release 28 of DOS/VS. CPU saturation was also on the horizon.

So Raymond exchanged the rented 370/125 for a 256K 360/50 system from DPF, Inc., a third-party lessor. The package included Memorex 3330-equivalent disk drives and the Extended Disk Operating System (Edos) from the Computer Software Co.

"We are now paying about 10% less a month and we have literally doubled our CPU power, without any question," Fairbanks said.

The extra power has also saved Raymond about $1,000/mo in overtime charges it was incurring on the rented 125. The company has been able to drop weekend work as well.

While IBM 370s do offer such "bells and whistles" as superior error recovery, integrated adapters and VS, "370 price/performance is not competitive with what we have now," Fairbanks said.

Considered Options

Raymond had been using four 3330 spindles, the maximum IBM supports on a 125, when it ran out of disk capacity. The company considered going to a 135, but that would have been too expensive, Fairbanks said.

Another possibility was to keep the 125 but replace the four 3330s with eight 3340 data module drives. This option also called for two 3410 tape drives and the addition of another 128K.

But the 3340s would have presented a problem, since Raymond is a Data Base Organization and Maintenance Processor (Dbomp) oriented shop, Fairbanks said.

"Dbomp's structure will not let you develop any cylinder address beyond 511," he explained. "Since the 3340 has almost 700 cylinders, you're letting yourself out of using about 200 cylinder/pack as far as Dbomp is concerned."

Raymond could have replaced its Dbomp data base with IBM's Data Language/1 DOS/VS data base, but that would have been too big a move for the company's needs and budget, Fairbanks said.

The company then began looking at third-party lessors since "we had heard about their putting 3330s on a 50," Fairbanks said.

The choice narrowed to Itel Corp. and DPF, who were both willing "to take total responsibility for the hardware and software," he said.

Raymond chose DPF because it preferred that vendor's five-year straight lease-proposal that was "full of outs" to the 36-month lease/purchase plan Itel offered.

Software Factor

Edos, part of the DPF package, also played a part in the choice. "It's got all the DOS enhancements that everyone likes," Fairbanks said.

Edos has "a 44K linkage editor that is at least four times as fast as IBM's," he said. The operating system also offers a relocatable loader, a resident transient feature, an "excellent" procedure library and a spooler, he said.

The conversion from Release 28 to Release 27 of Edos required recompilation but no recoding, Fairbanks said.

The transition was not without its hitches. The disk drives were slightly damaged in transit, but Raymond could not postpone installation, which was set for a two-week plant vacation in August.

Small disk problems took a couple of months to eliminate, but the equipment appears to be reliable now, Fiarbanks said.

Software was 90% reliable about three weeks after it was installed. Lately its reliability has climbed to about 95%, he said.

Proved Its Power

The 360/50 system soon proved its power to the Raymond DP staff.

A detailed materials requirements planning application using the Dbomp data base had run in 40 hours on the 125, but needed only 17 hours on the 50 during a benchmark comparison.

"We would have been happy if the job ran as slowly as on the 125, for the price we were paying for the 50," Fairbanks said.

Perhaps 25% of the runtime difference for the shop's Dbomp-oriented programs is because of the switch from DOS/VS to Edos, Fairbanks said.

"Dbomp is structured in overlays, which is inefficient for VS," he remarked.

Assemblies and ANS Cobol compilations run about twice as fast as before, as does any CPU-bound task, he added.

Other than the large Dbomp programs, the shop runs accounts payable and receivable and payroll jobs, Fairbanks noted.

Raymond's programmers have reacted favorably to the 370. "They like a stable operating system rather than continually having to go to new releases to get software support from IBM," Fairbanks said.

Along with the processor, operating system and disk drives, the third-party package includes two IBM 2501 tape drives, a 1403 N1 printer and a 2540 card reader.

The 360/50 system, including peripherals and maintenance, leases for about $10,000/mo. The 370/125 installation cost about $11,000 plus about $1,000/mo overtime rental, Fairbanks said.

Scan-Optics 501 Reads Journal Tapes

EAST HARTFORD, Conn. – The Scan-Optics System 501 is an optical scanner designed to read the journal tape or tally rolls prepared on adding and bookkeeping machines, cash registers and roll-paper impact printers.

While journal-tape reading capability has been available as an option within the cabinetry of Scan-Optics' 530 and 540 systems, the company is now offering the System 501 as a lower priced, separately packaged system.

Designed to accommodate a seated operator, the System 501 reads standard optical character recognition (OCR) fonts (NOF, 1428, 1403, 407, OCR-A and B alphanumeric) at up to 2,000 char./sec.

Line-reading speeds are determined by the number of characters read, tape width and data processing required prior to outputting to magnetic tape, Scan-Optics said.

The System 501 contains an 8K CPU expandable to 32K, a journal tape paper transport, 7- or 9-track 800 bit/in. magnetic tape drive, an I/O console printer and keyboard, on-line character insertion feature and 20 character positions.

Available Options

Options include a line printer, card reader, punched paper-tape reader and/or punch, 1,600 bit/sec magnetic tape and communications capability.

All Scan-Optics PRL software will operate with the System 501, which is compatible with other systems in the line which have journal-tape reading as an option. The 501 can be upgraded to a System 530 or 540 without loss of journal-tape reading capability, the firm said.

Prices range from $2,450- to $2,875/mo on a one- to three-year lease. Maintenance is $750 within Scan-Optics service locations. The company is at 22 Prestige Park, 06108.

CEC Claims Up to 50% Cost Saving For NCR 200/201 Add-On Memory

RANCHO PALOS VERDES, Calif. – NCR 200 and 201 users can acquire add-on or replacement memories from Computer Enhancement Corp. (CEC) for 25% to 50% below NCR prices, CEC said.

The company's Ram-Stor 200/201 is built by Electronic Memories and Magnetics Corp. (EM&M), the original equipment manufacturer of Century Series core memory, CEC said.

The Ram-Stor systems can contain up to 16 32K-byte core memory modules for a maximum capacity of 512K, CEC said.

A single logic card adapts the Ram-Stor system to the NCR system, providing data control and buffering "that guarantee complete compatibility with the NCR computer," CEC said.

The Ram-Stor's modularity allows for easy changes in the memory's size and facilitates maintenance, the vendor added.

CEC is at 3937 Stalwart, 90274.

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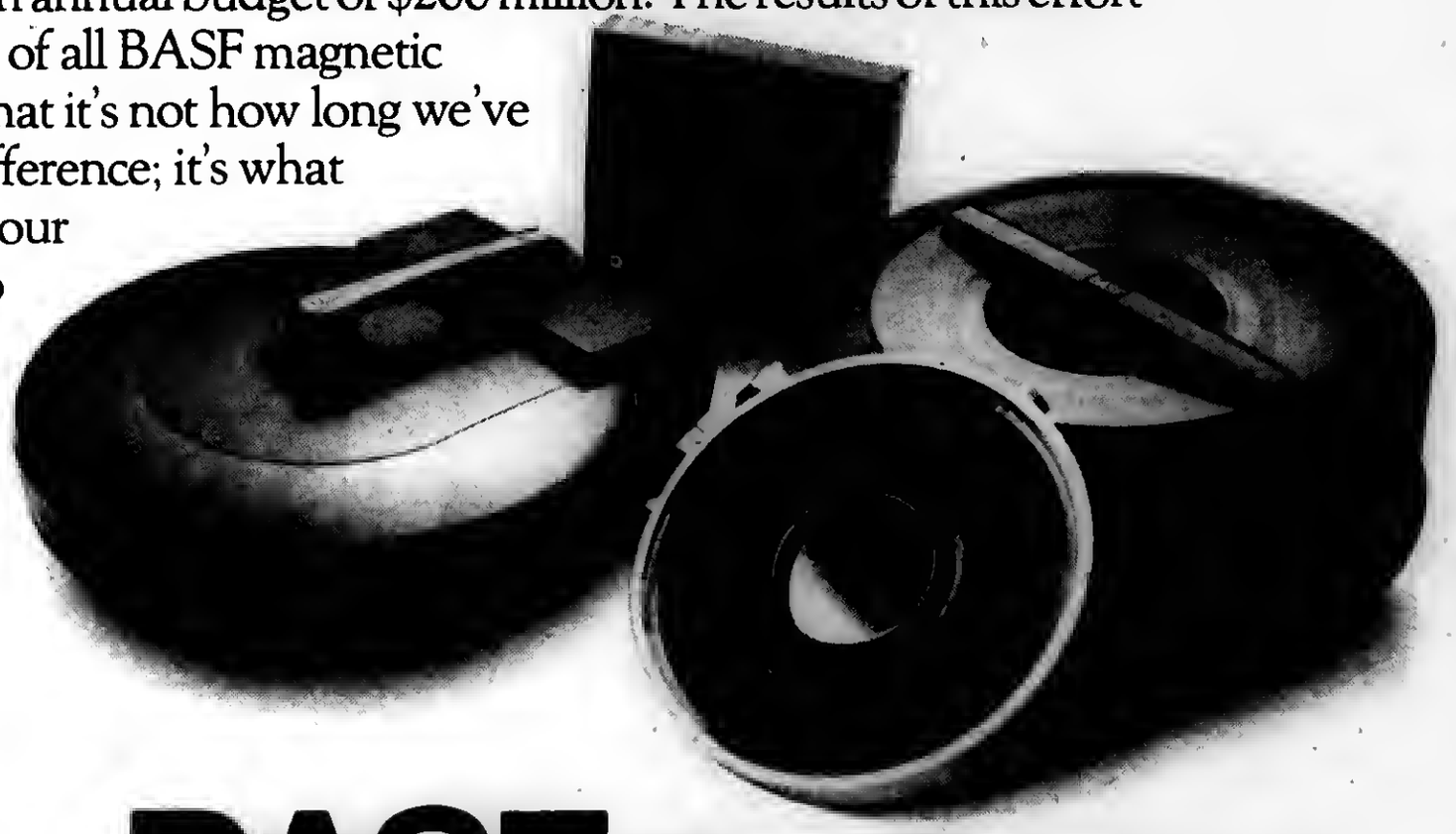
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BASF The Original.

Computer Tapes Disk Packs Flexydisks Word Processing Supplies

With Broomall Controller

430 Plotter Put Under 360/370 Control

BROOMALL, Pa. – Broomall Industries' plotter control unit puts the firm's 930 series flatbed data plotters operating in either the burst or multiplex mode under the control of an IBM 360 or 370.

Designated the Model 430/560, the control unit operatcs either with or without an optional core buffer memory expansion.

The memory expansion, which consists of two 1,024-character core buffers, operatcs in an interleaved manner to allow the plotter to read from one buffer unit while the computer I/O channel writes into the other.

The core buffer expander permits operation on the selector channel or the multiplexer channel in the burst mode, a combination offering maximum efficiency and flexibility, Broomall said.

Without the buffer expander, the multiplex channel is used in the multiplex mode.

Signal sequences for a complete I/O operation include initial selection, data transfer and termination. Data transfer proceeds only upon readiness of the plotter to accept data.

If unready, the plotter transmits a busy signal back to the channel.

The 430/560 plotter control unit costs $7,500 from 682 Parkway, 19008.

Versatec Units Produce Plots On 72-In. Paper at 1 In./Sec.

SANTA CLARA, Calif. – Versatec's 4472 plotter and 4472A printer/plotter produce plots on 72-in. wide paper.

A shaft encoder determines timing and print location as the servo moves the paper, resulting in a vertical plotting accuracy of .3 mil, according to Versatec.

Paper speed is 1 in./sec at the full 72-in. width.

Input data rate is a maximum of 110K byte/sec. Standard electrographic or translucent paper can be viewed on a horizontal flat bed of over 12 sq ft or an optional extension table that allows viewing of over 36 sq ft, the firm said.

Available with a 256-character Ascii set, the unit prints 12.5 char./in. and 6.6 line/in.

The 4472 plotter is priced at $43,500 and the 4472A printer/plotter at $46,900 from the firm at 2805 Bowers Ave., 95051.

Fiche Reader Suited For Brightly Lit Sites

SCHAUMBERG, Ill. – The Model 950 microfiche reader from the Bruning Division of Addressograph Multigraph Corp. is especially suited to viewing computer output microfilm (COM) in a brightly lit office, according to the vendor.

The Model 950 offers front projection. Thc user looks through a blue filter onto its 11-in. by 11-in. screen.

The company also announced the Model 920, a rear-projection unit with an 11-in. by 11-in. screen that is also designed for microfiche viewing.

Each microfiche viewer costs $185 from the firm at 1834 Walden Office Sq., 60172.

Arber Disk Packs Reduced

TORRANCE, Calif. – The Athana Model 360044 disk packs from Arber Industries have been reduced in price.

The 360044s are IBM 3336 Model II equivalents.

The company now offers the packs for $600 to $650. Lease/purchase and rental plans are also available from the firm at 1815 Mullin Ave., 90501.

Mark-IV Line Controls DP Rooms

SANTA FE SPRINGS, Calif. – The Mark-VI line of computer room environmental control systems from Supreme Aire was designed to combine high performance with minimum energy consumption, according to the firm.

The series includes five different types of equipment, including air-cooled, water-cooled, glycol-cooled, chilled water and the water-cooled Energy Saver. Capacity ranges up to 50 tons.

The Energy Saver series uses rejected heat from the refrigeration cycle to provide a reheat capability. This can save some users about $2,000/year in electrical bills, the firm said.

Mark-VI energy efficiency ratios are in the range of 10 to over 11 for most models, among the highest in the industry, Supreme Aire said.

The Mark-VI series has a control monitor that continually monitors a broad range of room and equipment parameters. It also contributes to the total energy conservation of the system by controlling operation of only as many stages of cooling as are required, the vendor said.

Temperature is controlled to within ±2 degrees and relative humidity to within ±5%.

A 26-ton Energy Saver model costs about $650- to $750/ton installed, a spokesman said from 8110 Sorensen Ave., 90670.

K/Tronic Packaged Disks IBM-Compatible, Certified

SANTA CLARA, Calif. – The K/Disks from K/Tronic, Inc. come IBM-compatible, certified and initialized, the firm said.

Five diskettes are contained in a package along with file folders, stick-on labels for the file folder tabs and program identification cards.

The package design allows for convenient storage in standard file cabinets, eliminating the need to procure special storage equipment, the vendor added.

The separate identification card with each disk allows the user to log program material separately from the disk jacket, avoiding the danger of damaging the recording surface of the disk by writing on the jacket or by attaching and removing numerous stick-on labels, the firm said.

The package of five diskettes costs $37.50 from 3620 Scott Blvd., 95051.

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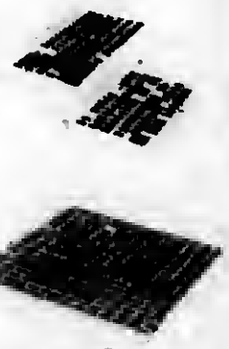
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Replaces Several Small Systems

Bureau Finds Net 'Holds Water' on Irrigation Projects

Special to Computerworld

DENVER – Like many other large organizations, the U.S. Bureau of Reclamation has replaced numerous small computers across the country with one central computer and a network of terminals.

The bureau's primary job is to develop the water resources of the 17 western states by constructing facilities that store and deliver water for municipal, irrigation and industrial use.

The bureau's Control Data Corp. Cyber 74, Model 28 both handles an administrative workload and serves as a tool for the bureau's engineers and researchers.

It helps them determine drainage requirements, predict the quantity and quality of return water flows from irrigated lands and track the weather, for example.

Until last year, the bureau had been performing these tasks on 24 separate, smaller computers, supplemented by more than $1 million spent annually on data services supplied by 14 vendors.

These 24 computers, scattered throughout the West, were unable to communicate freely with one another.

Now bureau field engineers can communicate with the central computer here through a readily accessible terminal and receive an answer in minutes.

Improved Efficiency

"The bureauwide network has improved operating efficiency by several hundred percent," according to D.W. Webber, chief of the division of data processing at the bureau's engineering and research center here.

"We have some of the top engineers in the country – and the computer network permits them to broadcast their specialized talents throughout the entire region," he said.

An Idaho study, using a computer estimate of water requirements, has shown how an irrigation management system can not only save precious water, but can increase crop yields by as much as 16%, while bringing the average 200-acre farm an additional $5,000 in income each year.

The computer estimates this water requirement by analyzing a test program which considers factors such as natural rainfall expectation, water-holding capacity of soil, effective root zone depth, percolation rate, daily climatic conditions, type of crop and the amount of soil moisture depletion.

This information is transmitted to the central computer by bureau field personnel, using a remote job entry terminal. Within 24 hours, the farmer receives a computer printout which gives him the optimum irrigation schedule over the next 14 days.

A computer program has been developed to optimize the design and placement of power transmission lines. Data fed into the computer produces a terrain profile of the area to be crossed, then determines the most economical mix of tower spacing vs. tower strength.

A tremendous amount of data must be accumulated before construction begins on a reclamation project. This data includes: site survey and selection, future benefits vs. project costs and types of materials to be used in construction.

Much of the technical and administrative data for solving scientific and engineering problems and for use as an aid in management practices of the bureau resides in a central file here where the information is stored in the computer's memory, on disk, tape and microfiche.

Called the Bureau of Reclamation Engineering Computer Systems (Brecs), this central repository makes available the software and documentation expertise within the bureau and facilitates communication between the various disciplines.

In the Bureau of Reclamation configuration, two central processors utilize a 128K 60-bit-word central memory, supplemented with a .5M-word extended core storage.

These memories are connected directly to 20 peripheral processors, each with its own 4K 12-bit-word memory, to handle the peripheral and input/output operations.

Four disk controllers and 20 disk drives provide 2.2 billion six-bit characters of on-line storage, backed by eight tape drives for off-line storage and processing.

Also at Denver are three 1,200 line/min printers, two card readers, a card punch, five communications controllers, 10 racks of telephone modules, eight multiplexers and six modems. This equipment is supplemented by 216 terminals.



At last, a system that makes credit verification as simple as it should be.

Ideally, credit card and check verification should be a simple "yes" or "no" proposition.

Unfortunately, at a lot of banks, supermarkets and other retail outlets, it's a complicated, time consuming process.

To solve the problem, Bell has designed the fast and simple to operate Transaction* telephone system.

The system includes the Transaction telephone terminal, the switched network, and 407 type data station interface. Plus, the data base computer.

The terminal itself is intended as the remote telephone in a digital inquiry-voice answer system. It has a single slot through which automatic dialing and bank or credit cards are passed. (If it's a check, the user keys in the account number.)

The Transaction telephone automatically enters customer and user information by reading the magnetically encoded ABA Track II stripe found on the back of most major bank and credit cards. It also fully buffers all of the data input.

Sequential instruction lights guide the user through the simple data input procedure. While the data is being entered, the telephone dials the number of the data base needed for verification. All of the buffered information is then sped through the switched network and the 407 type data station. Customer information is withdrawn, and an audio or visual response is relayed to the user.

In addition, the terminal can be used as a regular telephone. And it's available in Touch-Tone® or rotary.

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THE ART OF STRUCTURED THINKING

Yourdon announces four different courses dealing with different aspects of structured thinking.

Ed Yourdon, Bill Plauger, and Larry Constantine have all been in the vanguard of the "structured revolution." They, among others, will be teaching a number of "structured seminars" for Yourdon inc. in cities around the country over the next few months. To find out more about these courses, read on or send us the coupon on the lower right-hand side of the ad:

STRUCTURED DESIGN

This seminar is based on the definitive work done by Larry Constantine and Ed Yourdon. Course materials include the just completed 600 page manuscript *Structured Design* (Yourdon, 1975) by Yourdon and Constantine. The seminar concentrates on the design and structure of modules within a system, formalizing and quantifying the philosophy of "modular design." It introduces the concepts of coupling and cohesion, and discusses span of control, inversion of authority, pathological connections and transform-centered design as strategies for developing "good" designs for programs and systems. Course fee: $450. Dates and Locations: Jan. 28-30, Chicago; Feb. 9-11, Dallas; Mar. 24-26, Montreal; April 21-23, New York.

STRUCTURED DESIGN/ PROGRAMMING WORKSHOP

This 5-day seminar combines the major aspects of Yourdon's structured design and structured programming seminars, in a workshop environment. A major class exercise is used to illustrate the interactions between the "module design" strategies of structured design and the "GOTO-less" coding philosophies of structured programming. Course materials include *Structured Design* (Yourdon, 1975) by Yourdon and Constantine, and *Techniques of Program Structure and Design* (Prentice-Hall, 1975) by Yourdon. This seminar offers the participant an opportunity to test the theory in practical applications during workshop sessions. Course fee: $600. Dates and Locations: Jan. 12-16, Ottawa; Feb. 23-27, San Francisco; April 5-9, Washington, D.C.

STRUCTURED ANALYSIS

Structured analysis is a formal methodology for analyzing the user's requirements in a complex business environment, and a communication tool for precisely expressing well-structured thoughts in a manner that can be understood by users, management, and programmer/designers alike. One of the chief concepts of structured analysis is a top-down approach to the systems development life cycle, in contrast to the "classic" approach. Among the other important concepts are the use of data flow diagrams, hierarchical function charts and structured English as communication tools between user and analyst. Course fee: $300. Dates and Locations: Jan. 22-23, Los Angeles; Feb. 9-10, Montreal; March 18-19, Washington, D.C.; April 8-9, Chicago.



STRUCTURED PROGRAMMING

It is becoming more and more apparent that there is much more to structured programming than just removing the GOTO from one's code—there is "good" structured code and "bad" structured code. Structured programming is practiced differently in each programming language—there are very different guidelines for COBOL, PL/I, FORTRAN, APL and assembly language. Hence, Yourdon's structured programming course is given in each of the major languages.

STRUCTURED PROGRAMMING IN PL/I

Teaching the theory of structured programming is rather simple in this course, since PL/I contains almost all of the desired structures. However, recent studies have shown that the average PL/I programmer has had little practice actually using (and not abusing) nested IF-THEN-ELSE's, DO-WHILE's and block structures, so the course concentrates on practicing the use of these and other powerful PL/I facilities. Course fee: $450. Date and Location: Feb. 9-11, New York City.

STRUCTURED PROGRAMMING IN COBOL

It is well-known that COBOL provides some difficulties in structured programming, primarily because of its nested IF statements and its PERFORM-UNTIL. This seminar emphasizes practical techniques for writing good structured code in language that, to the structured programming purist, is at best mediocre. Course fee: $300 Date and Location: Mar. 8-9, New York City.

STRUCTURED PROGRAMMING IN FORTRAN

The language that Dijkstra called an "infantile disorder" has no IF-THEN-ELSE, no DO-WHILE, and no block structures. Nevertheless, this course teaches the programmer to write structured FORTRAN, with the assistance of the Rational Fortran (RATFOR) preprocessor—developed by Brian Kernighan at Bell Labs, and presented on magnetic tape to each student. Course fee: $300. Date and Location: Mar. 18-19, Washington, D.C.

STRUCTURED PROGRAMMING IN ASSEMBLER

The philosophies and techniques of structured programming are by no means restricted to high-level languages; this seminar uses IBM System/370 and PDP-11 assembler language to demonstrate the use of structured programming macros, "hand-compiling," and other techniques to write code that is both readable and efficient. Course fee: $300. Dates and Locations: Jan. 22-23, Los Angeles; April 26-27, New York City.

STRUCTURED PROGRAMMING IN APL

Precisely because of its cryptic, compact and complex nature, the issue of readability and maintainability is perhaps more important in APL than in the other languages. This seminar introduces the notion of an IF-THEN-ELSE function, a DO-WHILE function, and various other techniques to enable the programmer to write readable structured APL. Course fee: $300. Date and Location: Feb. 5-6, Boston.

For more information call Ms. Rikki Moss at Yourdon inc. 212 730-2670 or send this coupon to:

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Mini Bits

ACS Has Four-Bit Micro

PASADENA, Calif. – The ACS-4040MC series microcomputer from Automated Computer Systems is a modularized parallel four-bit general-purpose programmable computer.

It can be configured as an assembler/simulator system for software development with supporting operating system software or as a conventional microcomputer to be customized and programmed by the user for various applications.

The functional modules include a 4040 CPU printed circuit board (PCB); a 16-buffer output port PCB made up of a 2K-byte programmable read-only memory and a 1,280-word data read-only memory; eight-port tristate universal I/O PCB with handshaking capabilities; a plug-in switching regulated power supply module; and a full computer control/Hexadecimal display panel PCB.

The price is $2,115 from the firm at 2361 E. Foothill Blvd., 91107.

TMS 8080 Price Cut 75%

DALLAS – Texas Instruments (TI) has reduced the price of the TMS 8080 8-bit microprocessor by more than 75%. The purchase price of the TMS 8080 is now $34.25.

Continued high-volume experience on 4K random-access memories (RAM) was the major contributing factor in the reduction, TI said.

The TMS 8080 is supported by assemblers and simulators available through General Electric, National CSS and Tymshare time-sharing networks.

A full line of support peripherals including static RAMs, 4K RAMs, read-only memories and I/O devices are available, according to the company, which can be reached through P.O. Box 5012, 75222.

VRC Expands 4000 Capacity

SPRINGFIELD, Vt. – Vermont Research Corp. (VRC) has expanded the capacity of its VRC 4000 head-per-track memory and introduced an optional controller to interface the 4000 with Digital Equipment Corp.'s PDP-11.

The enhanced Model 4000 has 128 or 256 tracks, twice the number of data tracks originally available.

The standard bit rate is 4.25 mHz at 3,450 rev/min with 8.5 msec access time, one-third faster than the original Model 4000 access time, according to the company.

The VRC 4000 costs $4,650 in OEM quantities of 100 or over and the controller is priced at $4,500 in OEM quantities from the firm at Precision Park North, 05150.

Reconverts to System/3

Downtime Causes Firm to Replace B1728

By Esther Surden
Of the CW Staff

ST. LOUIS, Mo. – Excessive downtime on a newly installed Burroughs Corp. B1728 system caused Missouri League Service Corp., a credit union service bureau here, to convert back to the IBM System/3 Model 15 it had been using to process its 250,000 accounts a day.

According to William A. Rogers, manager of League Data Services, the company decided to install the Burroughs 1728 when additional capabilities to process an increased number of jobs were needed.

The firm runs jobs 24 hours a day in three shifts, 5-1/2 days a week and serves 130 credit unions in Missouri, southern Illinois and Arkansas.

The Burroughs system was installed last March, Rogers said.

The configuration included the B1728 processor, high-speed disks, two 715 line/min printers and additional head-per-track disk units and was to have cost $8,300/mo on a five-year lease.

Attractive Features

"The Burroughs machine had some features we can't get on the System/3," Rogers said. "High-speed tape drives and dual processing were features we considered attractive.

"On the System/3 we can run only two jobs at a time while, when the B1728 was running, we had seven or eight jobs going at once."

According to Rogers, the main problem with the system was Burroughs' lack of experience with it. The installation was the first in Missouri, and the service people just did not have the machine knowledge to get it running, he said.

"Also, they brought in gear that we felt was not fully tested," Rogers added. The Burroughs people were very cooperative, he continued, and brought in people from the outside to help.

Time and Aggravation

The company had an agreement with Burroughs that it would not pay until the system was operational, he continued. The total cost to Missouri League Services was about $1,500 in supplies, but more in time and aggravation, he said.

When the firm reconverted in September, changes were needed to cope with the increased job load.

The System/3 configuration included both a disk and tape system and cost the company $7,800/mo on a three-year lease plan, Rogers continued.

"We rewrote our main posting program from RPG-II into Cobol. By writing it in Cobol, we decreased the throughput by 65%, making the System/3 as fast as the Burroughs had been." The System/3 on Cobol is working out well, Rogers said.

The Burroughs system was too new, and everything we predicted could happen did happen, he continued.

Two of our four operators quit when we tried to install the new system, and the system went down and Burroughs couldn't fix it, he said.

Lowest Cost Time-Sharing System From DEC Based on PDP-11/V03

MAYNARD, Mass. – A four-user system based on Digital Equipment Corp.'s PDP-11/V03 microcomputer and aimed at educational users is said to be the firm's lowest cost time-sharing offering.

Called the MU/11V03, the basic system includes 28K words of memory, a dual floppy disk memory storage unit and a choice of either the 24-line VT-52 video display or the LA 36 Decwriter terminal and will cost $16,220.

The firm said three more terminals can be selected at additional cost from the following: a 12- or 24-line CRT, a 30 char./sec hard-copy terminal, graphics terminal and one with hard-copy capabilities.

Primary Applications

Primary applications will include computer literacy and usage studies; problem-solving and computation for mathematics, engineering and science; simulation of physical and social phenomena; and computer-aided instruction in mathematics and languages.

Users can write and execute programs in Basic, Fortran IV(optional for $700) or Macro Assembly language under DEC's RT-11 real-time operating system.

One Fortran IV or Macro program may be executed simultaneously with up to three Basic programs.

The system exemplifies PDP-11 family compatibility in that Basic or Fortran IV programs developed on the MU/11V03 will run on all other PDP-11 models, according to DEC.

Highlights of MU-Basic on MU/11V03 include string calculations, program chaining and virtual arrays.

Prices range from $16,220 for a single terminal version to $19,970 for the maximum four-terminal configuration. Initial deliveries are scheduled for January.

Decwriter II Gets Quietizer

CITY OF INDUSTRY, Calif. – Van San Corp. has a Quietizer enclosure for Digital Equipment Corp.'s Decwriter II.

The Quietizer Model 8527 costs $279.50 and is available within 45 days from the firm at 1180 Center Drive, 91748.

Device Manages Energy Loads

PLAINFIELD, N.J. – An energy management system based on the Lockheed Electronics Co., Inc. LEC 16 minicomputer has been introduced by Lockheed here.

Called the Lockheed 7600 energy management system, the unit automatically monitors and controls lights, heating, air conditioning, fans, motors, pumps and other electrical and gas loads.

One system can manage up to 31 buildings through "remote monitoring devices located in each building that work on demand of the host system," a company spokesman said.

Built-in 16 load-management programs enable real estate managers to tailor the system to building needs, he continued.

Other system features include self-check; automatic restart without loss of instructions; random load shedding; operation without computer knowledge; and daily, hourly or shorter period printout of savings consumption.

Basic model price is under $40,000, not including installation. The system is available from the firm at U.S. Highway 22, 07061.

Calcomp Adds OEM Floppy

ANAHEIM, Calif. – California Computer Products, Inc. (Calcomp) has announced the Calcomp 142 double-density floppy disk drive for OEM customers requiring up to 802K bytes of storage per diskette.

The Calcomp 142 incorporates a modified frequency modulation self-clocking recording code.

The 142 records up to 802K bytes of unformatted data per diskette. Transfer rate is 500,000 bit/sec and access time is 6 msec track-to-track.

The Calcomp 142 is priced at $650 in single quantities. Production units will be available for delivery this month, the firm said from 2411 W. LaPalma Ave., 92801.

Primesharing:

A virtual memory Prime 300 is like having up to 31 separate computers in one box. Each user has access to a complete virtual computer system that includes a processor with microprogrammed floating point arithmetic; high-speed disk file storage; 128k bytes of 600 nanosecond access MOS main memory; FORTRAN, BASIC and Assembler languages. Users can simultaneously develop real-time application software, handle data base management, execute complex computational programs, develop microprograms for the system's writable control store...and more. Write or call Prime for full details.

buy a 31-user system for less than $5,200 per user.

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System Ensures Equipment Supplier Has Parts on Hand

DENVER – A minicomputer purchased for on-line inventory control helps a gas and oil industry equipment supplier here replace its customers' parts quickly.

A customer waiting for a part can lose up to $10,000 a day in production costs, Pamco said, so inventory control is essential.

"We had no real control before," Secretary-Treasurer L. Glen Finley said.

"The result, with 26,000 parts in stock, was that we were undoubtedly carrying many more items than necessary just to make sure we could respond to any demand."

Pamco is a distributor for more than 100 makers of industrial power equipment, with the principal one being the Waukesha Engine Division of Dresser Industries, Inc., a large maker of natural gas-fueled engines.

Pamco is also a fabricator of electric plants, gas compressors and pumps. In a normal month, Pamco's office staff here processes 2,200 invoices which average six line items each.

This volume, along with the other paperwork, provided a second impetus for the entry into DP.

For a time, an accounting machine with a small drum memory and punched paper tape files had been adequate, but it was too slow and too limited to keep pace with the company's growth.

"If we had been concerned solely with accounting functions, any number of batch-processing computers would have been suitable," Finley said.

"But because of the need for timely inventory control, an on-line system was the only feasible answer."

Pamco considered IBM, Quantel and Lockheed systems before going with an NCR Century 8200, Finley said. IBM was rejected because of price, and Quantel and Lockheed were unable to provide the necessary support, the company felt.

NCR had the best system and seemed to be in the business to stay, Finley added.

The configuration selected has a 32K central processor, a 300 line/min printer, a 300 card/min reader and four magnetic disk spindles, two of them stationary and two removable. Each of the disk packs puts 5M characters of information on-line. A CRT terminal serves as the operating console.

Input data is keypunched, but it is anticipated that it will later be done on the console CRT and another such unit. A third CRT will be located in the parts department for inventory depletion.

"The computer system we have now will handle double the present volume of business," Finley said.

"Beyond that, we can double our disk pack capability, add more CRT units and increase the number of line printers."

This explains, in part, he continued, why Pamco decided to purchase the 8200 system.

The price was $75,000, plus sales tax and a maintenance contract, as opposed to an annual lease outlay of $28,000. Finley estimated the company's investment will pay out in a maximum of four to five years.

Accounting Operations First

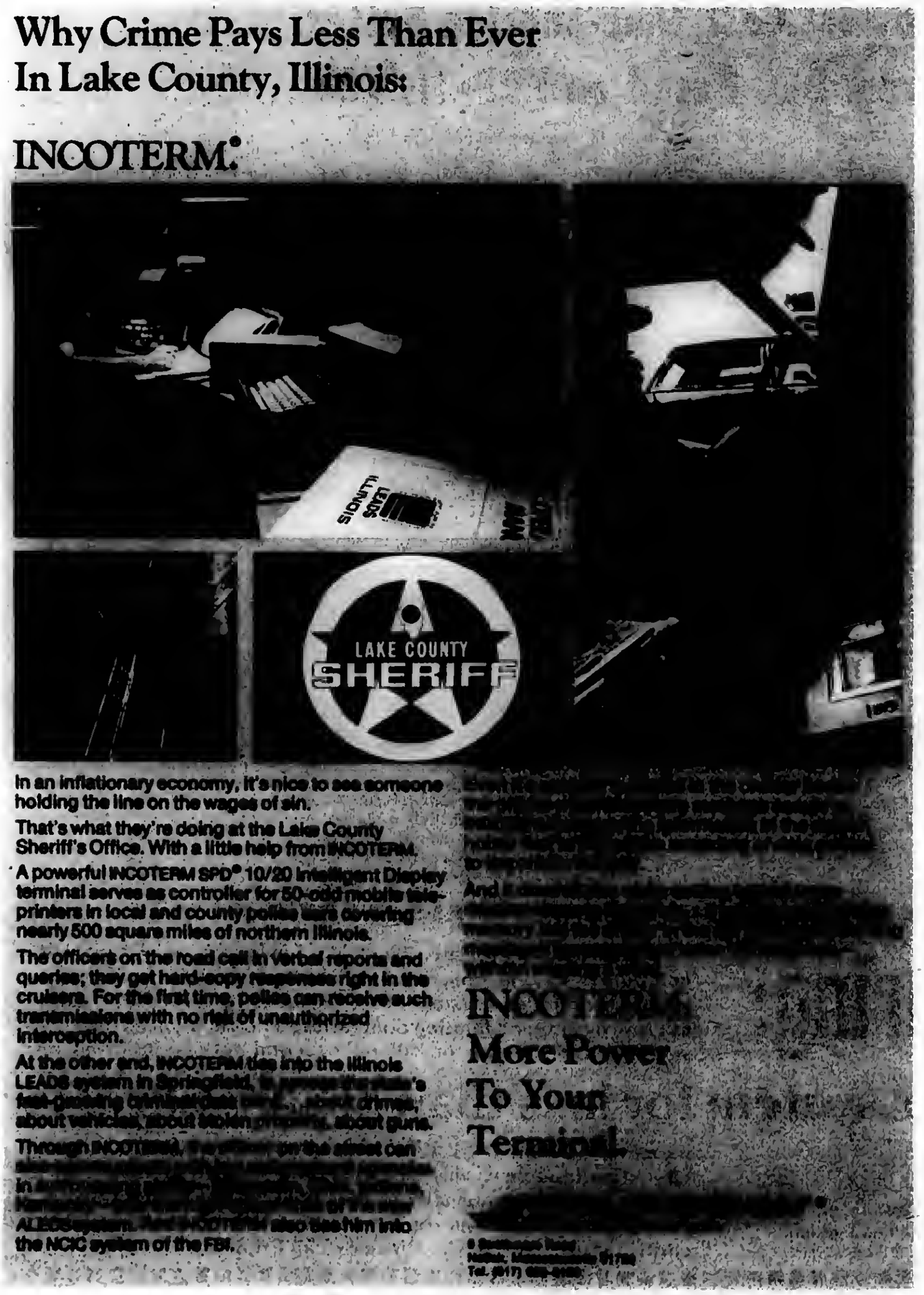
Although inventory control is critical, accounting operations received first attention. Within two months after the May installation, accounts receivable and payable, the general ledger, the 150-person biweekly payroll and financial statements had all been converted using programs provided by NCR.

Showing management "instant" results was important, according to Finley. "All too often, it can take six months and more before a computer center is able to produce."

Pamco derived immediate benefits from its computer installation, according to Finley. The old machine could only do a balance-forward operation, applying payments to the lump sums owed.

Now payments are applied to open items. This is informative for the company and helpful for its customers because, to keep their own records straight, customers need to know the details of items for which they have paid and items for which they still owe.

Among the reports produced by the computer are a twice-a-month listing of delinquent accounts receivable, a comparison of budgeted and actual costs, purchases by vendors and sales breakdowns by branches.



Floppy Controller Available From Icom

CANOGA PARK, Calif. – A floppy disk controller designed for use by OEMs in industrial, commercial and development applications is available from Icom, Inc. here.

The Model CF360 can accommodate from one to four floppy disk drives and includes a general-purpose interface compatible with most microprocessors and minicomputers, the firm said.

The controller is fully IBM 3740 and 3540 compatible with all formatting and deformatting accomplished automatically within the controller. The controller also performs track seek/verify and cyclic redundancy check generation and verification automatically.

Independent 128-byte (full-sector) input and output buffers offer the possibility for direct memory access or programmed I/O operation. The ability to write/protect individual drives also is provided by the controller.

The CF360 single unit price is $850 from the firm at 6741 Variel Ave., 91303.

Datum Releases Disk System

ANAHEIM, Calif. – A ten-platter, moving-head disk system for Data General Corp. Nova and Eclipse, Digital Computer Controls, Inc. D-116 and Keronix, Inc. IDS-16 minicomputers has been introduced by Datum, Inc.

Designated the 4091-N, the disk drive and controller sells for $9,995 in unit quantities, significantly below the $15,000 to $16,000 price of comparable units, the firm said.

The unit has a storage capacity of 30 bytes by 10^6 bytes with a recording density of 2,200 bit/in. Average random access time is 55 msec, data is recorded on 20 surfaces at 100 track/in., with 203 track/surface. Data transfer rate is 312 kbytes/sec.

The system costs $9,995 and is available from the firm at 1363 S. State College Blvd., 92806.

For County Coroner's Office

System Helps Piece Together Pathological Puzzles

LOS ANGELES – A minicomputer-based analysis system is solving pathological mysteries which previously would have been filed away as "unknown" by the county coroner here.

Using a recently installed minicomputer-controlled gas chromotograph/mass spectrometer, the coroner's toxicological laboratory has been able to determine the exact cause of death in many cases where conventional equipment would not have been able to do the job.

Edward Thompson, senior toxicologist at the coroner's office, cited as an example the case last summer of the badly decomposed body of a woman which was found floating in the waters off the coastline.

When conventional testing methods failed to identify the reason for the woman's death, the gas chromatograph/mass spectrometer manufactured by Finnigan Corp. in Sunnyvale, Calif., determined the woman hadn't drowned, but had been poisoned and them dumped into the ocean. The results set off a police investigation.

"Had the case come to us several months earlier, we might have not been able to determine the exact cause of death, because it is almost impossible to analyze badly decomposed products using conventional equipment," Thompson said.

Chief advantage of the Finnegan equipment is its ability to tell the toxicologist exactly what a specific compound is, Thompson said. "Now, we can quickly and precisely analyze a wider range of organic compounds than is possible using conventional equipment."

Nearly 16,500 cases pass through the coroner's office each year, and approximately 6,000 of these fall into the hands of the toxicology lab.

The heart of the system is a Computer Automation, Inc. Naked Mini system which gathers, records, analyzes and displays the data it receives.

The system works this way: a toxicologist enters the extracted specimen into the units. Then, a gas chromatograph separates the complex chemical mixtures into constituents for analysis.

The constituents then are electronically scanned and converted into digital representations that are stored in the minicomputer's memory. This digital representation, when called out via the keyboard, is converted into information that is displayed as mass spectra – a series of peaks along a line – on a CRT.

The computer's memory stores the names and mass spectra numbers of hundreds of drugs and other substances.

Through a keyboard, the toxicologist can search the memory to identify the compound most like a given mass spectrum. The computer provides a printout of all compounds resembling the unknown and indicates the degree of match.

Without the computer, the same analysis would require manually comparing raw data from a mass spectrometer and then comparing the mass spectra of one compound against a library, a process that would take days, he explained.

"We still use all our conventional laboratory techniques for the thousands of routine analyses which are performed each year," he said. "But when we have problems in identifying a compound – maybe we're just not sure; maybe we have no idea what it is – that's when we find the system an invaluable tool."

Hospital Pins Down Food, Lab Charges With Aid of Mini

PHILADELPHIA – A minicomputer at Hahnemann Hospital here has saved the institution an estimated $1.5 million by pinning down laboratory charges and curtailing unnecessary food preparation.

Hospital admissions procedures have also been reduced to under 30 minutes.

Under the previous manual system, 30% of $5 million in laboratory work was not picked up, according to Marin Reich, vice-president of RMC, Inc., the company that manages the computer facilities for Hahnemann.

Mumps Packages

The system consists of two Mumps-11 software packages operating simultaneously on a Digital Equipment Corp. PDP-11/45 with 48K of core and 16K MOS memory. The system is able to process over 40M characters of information.

Mumps is a data base management system that works with both numerical and textual data.

Admission-Discharge-Transfer (ADT), the first software package developed for Hahnemann by RMC and Advanced Medical Systems, Inc., follows a patient from admission through discharge. The second package, called Multilab, maintains a daily in- and out-patient file on all lab work.

When a patient arrives at Hahnemann, he is assigned an identification number and the admission clerk requests ADT for a display of available beds by floor, room or nurse's station. The patient is assigned a location suited to his requirements.

If the patient's status or location are changed during the hospital stay, the file is updated and the information appears on a list printed out every day.

In one year, knowing how many meals to prepare and where to send them saved the diet kitchen $36,000 in food costs.

With the Multilab package, 14 remote terminals connected to the PDP-11/45 are situated in the laboratory. The program maintains a daily file for all in- and out-patient tests and gives work-in-progress reports on the status of all tests performed in the lab, including a physicians report of the results of tests on all his or her patients that day.

The computer assigns a number to each test and generates a list for morning blood collections, according to priority and location of the patient.

Maybe your computer could help find a way to get management off your back.



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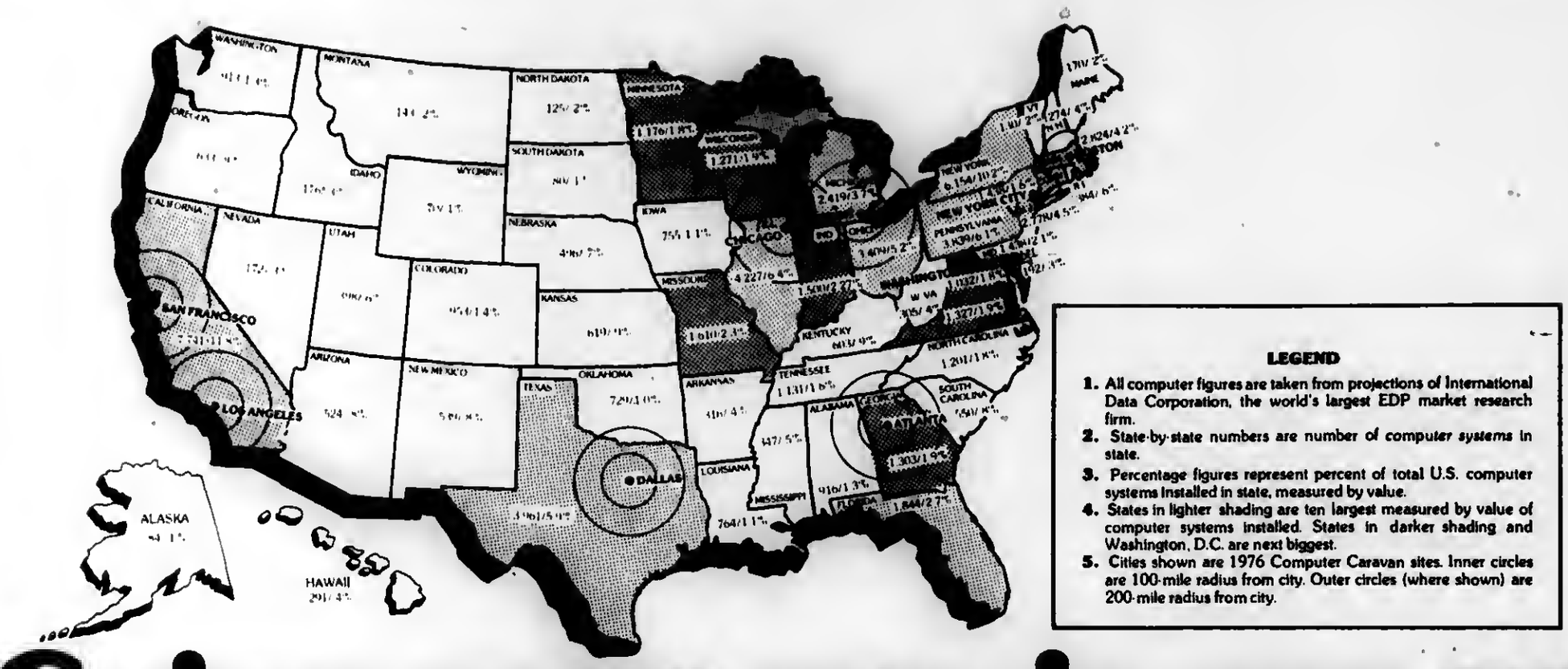
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LEGEND

1. All computer figures are taken from projections of International Data Corporation, the world's largest EDP market research firm.
2. State-by-state numbers are number of *computer systems* in state.
3. Percentage figures represent percent of total U.S. computer systems installed in state, measured by value.
4. States in lighter shading are ten largest measured by value of computer systems installed. States in darker shading and Washington, D.C. are next biggest.
5. Cities shown are 1976 Computer Caravan sites. Inner circles are 100-mile radius from city. Outer circles (where shown) are 200-mile radius from city.

Going your way is our way.

Computer Caravan/76 brings a national computer conference to key computer-using states across the country.

Measured by value of computer systms installed, the ten largest states in the U.S. (lighter shading on map) account for more than 60% of all computer systems in the United States. Adding the next biggest areas - 7 states and the District of Columbia (darker shading on map) - we get to more than 75% of all the U.S. Computer systems, measured by value. And it's these key states in the computer world which will be host to - or nearby - one or more of the nine cities in the Computer Caravan / 76 - the travelling computer users' forum and exhibition sponsored by *Computerworld*.

To computer professionals, this means a unique opportunity to see a national computer show without leaving the office for a week and travelling across the country. It's a chance to keep up on the latest information in our user-to-user forums and on the latest products and services in our complete exhibition.

And thousands of computer professionals will take advantage of this opportunity as the Caravan moves across the country. The '76 Caravan can expect attendance of over 30,000 computer professionals, and unlike any other computer show, significant numbers of attendees will come from each of 15 states and the District of Columbia -- representing 65% of all U.S. computer systems installed. That's true national coverage.

As a marketer of computer products and services, the Computer Caravan offers you a unique opportunity to meet the professionals who run our country's computer installations in a one-to-one, business oriented atmosphere. Because there are 27 different show days, no one Caravan day is too crowded to give you the opportunity to present your products or services in detail -either on our exhibit floor, or in your own product seminar. And the 1976 Caravan offers several innovations which can make it more suitable to your individual marketing problems:

1. For companies with limited marketing areas, there are 3 regional tours (East, Midwest or West) to choose from - or our new "Major City Tour" (New York, Chicago and Los Angeles). You'll be covering only part of the total market, but that may be all you want - and costs are much less.
2. For companies specializing in the OEM market, there is our new companion show, COMPDESIGN 76. Sponsored by *Computer Design* magazine, this show will appear in the same halls with the Computer Caravan in five key OEM markets: Boston, New York, Chicago, San Francisco, and Los Angeles. It will attract thousands of key computer designers, and will also be open to Caravan attendees in those cities.
3. Data communications marketers can take advantage of our DATACOMM 76 add-on, which gives you a spot in the national data communications show sponsored by *The Data Communications User* magazine.

There's a lot more we'd like to tell you about Computer Caravan / 76, but if you're interested in exhibiting, time is short. So send in the coupon right away.

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COMPUTER INDUSTRY

CI Notes

House Gets Unchanged 'Disc'

WASHINGTON, D.C. – The Tax Reform Bill has been voted out of the House Ways and Means Committee with the Domestic International Sales Corp. (Disc) provision unchanged [CW, Oct. 15].

As the tax bill is now written, firms with a Disc can defer taxes on a maximum of 25% of their average annual export earnings.

Firms with export profits under $100,000 would still be permitted to defer 50% of taxes due on total Disc incomes.

The measure will probably be approved on the House Floor, but faces an uphill battle in the Senate, sources said.

Incoterm to Make Automatic Teller

NATICK, Mass. – Incoterm Corp. plans to enter the automatic teller business through a license from Transac, a subsidiary of CGE in France.

The agreement gives Incoterm manufacturing and distributing rights for an automatic teller machine in the U.S., Canada and Mexico.

Incoterm similarly licenses Transac to make and distribute its intelligent display terminals in common-market countries. Transac uses Incoterm minicomputer designs in its automatic teller machine, Model T-24.

Incoterm said it looks upon the T-24 as a logical extension to its Series 7000 on-line banking system.

Tymshare to Buy Autex

CUPERTINO, Calif. – Tymshare, Inc. has agreed in principle to acquire the business and operations of Autex, Inc. in an exchange of stock.

The agreement is subject to completion of a definitive agreement and approval by the Autex shareholders.

Supershorts

Arber Industries International has signed YB Computer Services as distributor in the UK for its Athana magnetic media.

– – –

Microdata Corp. has named CMC Germany as German distributor of Microdata's Reality system.

– – –

Okidata Corp. has selected Data Dynamics Group Ltd. and its subsidiaries to distribute Okidata peripherals throughout Europe. Data Dynamics has ordered CP110 printers valued at over $1 million.

– – –

Diablo Systems, Inc. has delivered its 25,000th Series 30 disk drive.

With Most Units Installed

DEC Ranked First in '75 Federal Census

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – Digital Equipment Corp. pushed Univac to second place to become the top-ranking vendor this year in terms of the number of computers installed in Federal government agencies.

IBM came in third, but retained its number one place for value of equipment installed, according to the "Inventory of Automatic Data Processing Equipment in the U.S. Government" for fiscal 1975 issued by the General Services Administration.

The report listed DEC with 1,699 installed machines and Univac with 1,368. IBM was a close third with 1,320.

Honeywell placed fourth with 706 units and was followed by Control Data Corp. (CDC) with 541; Data General Corp., 372; and Hewlett-Packard Co. (HP), 361.

Xerox was close behind with 360 machines while Burroughs Corp. accounted for 315 and Varian for 193.

Manufacturers classified as "other" had the second largest installed base, with 1,414 machines.

The number of computers installed within the government as of June 30 totaled 8,649 with a value of $1.4 billion, according to the report.

IBM Leads in Value

In terms of value of installed CPUs, IBM was out ahead with $441.6 million, followed by CDC with $329.1 million, Univac with $187.7 million and Honeywell with $118.2 million.

DEC was fifth with $54.8 million, followed by Xerox with $46.3 million, Burroughs with $41.3 million, HP with $11.3 million and Data General with $9.1 million.

Including the value of peripherals such as storage units, I/O units and communications terminals, the ranking stayed the same in the first four places. Burroughs became fifth, Xerox sixth, DEC sunk to seventh and HP was eighth.

The value of IBM equipment installed in the government totaled $1.5 billion as of June 30, the report indicated, whereas that of DEC was $99 million.

IBM Share Shrinking

IBM's share of the installed government base in terms of numbers of machines has been steadily shrinking. IBM held 54.8% in 1960, 42.3% in 1965, 26.4% in 1970 and 15.3% in 1975, according to the report.

Burroughs, CDC, Univac and Xerox all held a smaller portion of the installed base by number of units than they did in 1970.

Burroughs went from 3.9% in 1970 to 3.6% in 1975; CDC, 7.7% to 6.3%; Univac, 22.7% to 15.8%; and Xerox, 4.3% to 4.2%.

DEC's share soared from 9.5% in 1970 to 19.6% in 1975. Honeywell's portion grew from 5.6% to 8.2%, according to the figures.

Acquisitions Down

Undoubtedly no secret to vendors is that government acquisitions of DP equipment, including peripherals, during 1975 took a sharp drop downward from 1974 – from $725.4 million to $493.8 million.

The value of CPUs acquired during 1975 dropped to $146.9 million from $225.3 million last year, but the number of CPUs, indicating increased minicomputer acquisitions, dropped only to 851 from 1,240.

Storage units acquired in 1975 declined in value from $293.1 million in 1974 to $195.5 million while communications terminals dropped from $56.2 million to $34.7 million.

By far the biggest user was the Department of Defense with 4,245 machines, of which the Air Force had 1,651.

The Energy R&D Administration came in second with 1,904 machines and the National Aeronautics and Space Administration ranked third with 1,114 machines.

DEC's number one rating was helped considerably by its 1,013 machines installed within the Energy R&D Administration, which also had the largest concentration of Data General machines (101 units).

Univac, IBM, Honeywell, CDC and Burroughs had their largest concentrations in the Department of Defense.

(Continued on Page 35)

Adapso President Calls Expertise Service Firms' Greatest Asset

NEW YORK – Services firms should be placing more emphasis on marketing their most important asset – which is not computers but expertise, according to Leon Weisburgh, newly elected president of the Association of Data Processing Service Organizations (Adapso).

"I think we have been misleading ourselves on what the reason for our existence is," Weisburgh said. The reason is generally thought to be to share computer power, but "it's really not computers, it's our expertise in transcending all the areas of the use of the computer – the operations, the programming, the systems, the control.

"The emphasis should be on the people part of the computer and not on the computer part," he said.

Weisburgh said his thesis applies to almost all types of services firms except those that sell raw time. This sector, he added, has traditionally been the most unprofitable.

Those companies that are profitable are basically selling packages and their ability to put together and use the packages, he said.

"Clients care that the services firms have people who can relate to their needs. They don't care about the computers the firms use," he said.

Many clients have indicated they have in-house DP managers who didn't know the firm's business, but simply knew how to run the hardware.

"We are relating to management needs. The customer couldn't care less how we solve them, as long as he has reports that let him run his business," Weisburgh said.

Growing Specialization

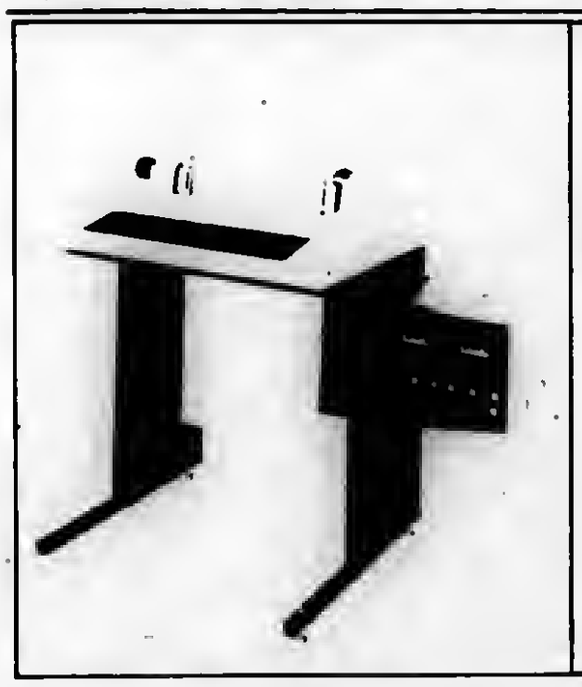
"We're getting more and more specialization in our industry by both application and by type of business," he said. "This has been very dramatic over the past 10 years, and I expect it to become even more fragmented" with hardgoods manufacturing as opposed to softgoods manufacturing, or medical groups as opposed to hospitals.

"This industry expertise reinforces the argument that the DP services industry offers American business computer skills along with a highly trained base of personnel who know how to solve specific business problems.

"Is it necessary for the typical computer user to constantly reinvent the wheel, when so many of the answers and solutions are being applied daily by DP services companies?" he said.

"Not only does the DP services industry provide specific expertise, it generally accomplishes tasks within a shorter timeframe and at a lower cost.

"How often have we heard of a computer department missing a target date because key individuals were bogged down in some daily routines? Or computer programs that needed repeated revisions as a new application became operational? Or the steady increase in equipment costs to provide more capacity during peak periods? he asked.



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Tests by CDC Show

E. German CPU Outperforms 370/145

WASHINGTON, D.C. – The East German-built ES-1040 computer is twice as powerful as IBM's 370/145 in internal computing power, according to tests run by Control Data Corp.

The 1040 is a member of the Ryad series of machines, designed to be compatible with each other, built by various Eastern Bloc countries. The unit's operating software is fully compatible with that used on IBM 360s, according to Robert A. Koenig, who detailed the test results at a recent press briefing at which CDC displayed but did not demonstrate the 1040 [CW, Dec. 3].

Running the Gibson mix of programs, a standard test that measures the internal power of a system, the 1040 was found to be twice as powerful as the IBM 370/145. Test score for the 1040 was 2.40 compared with 1.23 for the CDC Cyber 73, 1.77 for the IBM 370/155, 4.95 for the 370/145 and 6.50 for the 360/50.

Results of a second test to determine the system's arithmetic capability showed the 1040 can add, multiply and divide three to four times faster than the 370/145.

Koenig said CDC is still testing the speed of the processor memory in business DP applications, but thus far company officials believe the 1040 will prove to be at least equal to the 370/145.

CDC also tested the 1040's ability to run problems written for the 360, Koenig said. The most crucial test involved running a set of jobs from CDC's Service Bureau Co. (SBC).

This test showed the 1040's instruction set compatability allows all software and applications programs written for the IBM 360 to run on the 1040 and other compatible members of the Ryad family, Koenig said.

As for technology, the 1040's CPU is constructed from integrated circuits that belong to the transistor-to-transistor logic (TTL) family. Made in East Germany, the circuits appear identical to those manufactured by such U.S. companies as Texas Instruments, Motorola and Fairchild, Koenig said.

"A Ryad 1040-class machine could have been built in the U.S. in 1968 or 1969 using domestic sources," he said. "However, its appearance as a prototype in late 1972 indicates a three- or four-year technology lag in integrated circuits."

Several advanced design techniques are responsible for making the machine as fast as it is, including microprogram control of the processor and its input/output channels and an instruction look-ahead feature which allows the processor to overlap the functions necessary to execute an instruction, Koenig explained.

The core memory is somewhat slow compared with the speed of the processor, with the result that performance could be enhanced with a faster memory, he said.

Describing the technology as 10 years old by current U.S. standards, Koenig noted this shortcoming is partially masked by a wide path to memory and a look-ahead feature that allows the processor to overlap the functions necessary to execute an instruction.

The 1040 has a memory capacity of up to 1,024K bytes of core, with a typical unit made up of from two to four modules, allowing memory interleaving for greater throughput, he said.

Memory accesses are made in terms of double words – 64 bits – with 450 nsec access time and a 1,350 nsec cycle time. The theoretical memory transfer rate of 142 Mbit/sec, he added.



The ES-1040 model in the Ryad series and East European peripheral devices were shipped to the U.S. for evaluation purposes by Control Data Corp.

The main memory also features a storage-protection memory which allows blocks of 2K bytes to be protected by a 4-bit flag. This is useful for multiprogramming and protection of the operating system.

The 1040's CPU contains 16 general-purpose registers with a capacity of 32 bits.

The processor operates under microprogram control. Its microprogram, which is stored in read-only memory (ROM), has an access time of 11 nsec and a complete cycle of 450 nsec.

The 1040's instruction set contains a total of 143 commands, of which 87 are basic and eight are concerned with decimal arithmetic. Forty-four deal with floating-point operation, and the remaining four are divided between direct control and storage keys.

The real technology lag is evident in the Ryad peripherals, he said.

The disk system consists of a controller and two 7.2M-byte disk drives made in Bulgaria.

The East German-built tape subsystem uses a controller and two 9-track, 800 bit/in. drives that operate at 75 in./sec. They require three large cabinets in contrast to the one required to house a comparable CDC unit.

The system's 80-column card reader operates at 500 card/min and the card punch at 120 card/min. Both were made in the USSR.

The line printer has speeds up to 900 line/min and a feature that allows different forms to be printed simultaneously.

"To my knowledge, no domestic manufacturer offers this capability," Koenig said.

The Ryad 1040 uses two types of I/O channels, a multiplexer for slow-speed devices and up to six selector channels per system for high-speed units.

Channels are assigned different priority levels for memory access and have varying data rates that can be sustained with all channels active, Koenig said.

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In U.S. vs. IBM Hearing

GE Officer Details Accounting Methods

By Edith Holmes
Of the CW Staff

NEW YORK – "Eventually, everything is charged to profit and loss," John Ingersoll, a General Electric Corp. (GE) vice-president, said in explaining differences between GE's and Honeywell, Inc.'s methods of accounting for GE's computer business.

Ingersoll was responding to a question from IBM counsel in a U.S. vs. IBM antitrust case hearing held here recently to find out whether the companies' assessments of the worth of these assets meant anything.

The witness indicated essentially they did not, testifying GE tended to segment its accounts according to parts of specific businesses in an industry – "if the industry can be defined."

At the same time, Ingersoll stated the profits and losses associated with specific machines like GE's 605 military computer, its point-of-sale Tradar system or the GE645 were not accounted for separately or by product line.

Honeywell, however, made an effort to match expenses with revenues, he noted, adding that because of recent Financial Accounting Standards Board (FASB) rulings, this is no longer considered a sound accounting practice. Now all research and development expenses are charged directly to manufacturing costs.

In the long run, Honeywell's and GE's pictures of GE's financial ups and downs with its computer business would look the same, he concluded.

Ingersoll was part of the support staff for the Ventures Task Force which reviewed the plans for GE's Advanced Product Line (APL) and recommended the discontinuance of the computer business.

Those who devised the APL believed it would be possible to take away from IBM's market share given certain high risks, Ingersoll said.

One of the high-risk assumptions that went into the plan was the notion that IBM would accept a decline in its market share from 65% to 70% down to 59%, he stated.

GE would also be risking a great deal by an additional assumption that its other competitors would stand still while GE went after IBM.

Asked by IBM attorneys whether he knew the Antitrust Division of the Department of Justice would not have permitted GE to acquire a controlling interest in any entity resulting from the merger of its computer business with that of another, Ingersoll said he thought that such a government attitude was probable, but he didn't know it to have existed for a fact.

He did understand some of his superiors to be of the opinion that GE had the resources to be successful or that it needed to acquire a controlling interest in such a combined venture.

These people felt the Antitrust Division had set up obstacles to GE's acquisition of such control, he said.

In the decision not to go with the APL but to merge with Honeywell and to do so without a controlling interest, Ingersoll indicated few of those making that choice had extensive background in the marketing and manufacture of computers – including GE's current chairman and chief executive officer, Reginald H. Jones.

Ingersoll discussed the decision from the viewpoint of GE's losses of about $180 million through its computer business through 1970, the capital requirements of leasing and the management judgment that APL would be "an inappropriate project for the company to undertake because of the high risks associated with it and the effect it would have had on the company's finances."

DEC Heads '75 Federal Inventory In Number of Systems Installed

(Continued from Page 33)

Several trends begun in recent years continued during 1975. Machines falling under special management classifications continued to outnumber the machines in the general management classification, totaling 5,027 and 3,622 respectively.

Special categories included those machines in mobile or classified locations and those used for control or monitoring of a process or other equipment.

This trend began in 1973 when special classifications for the first time outnumbered the general category, 3,717 to 3,432.

In the general category, the ratio of owned computers to those leased continued to grow. In 1975 there were 2,670 purchased machines and 952 leased compared with the 1974 figures of 2,481 owned and 1,006 leased.

Under the general management classification, while systems with purchase price of $50,000 or less accounted for 11% of the number of total systems, they represented only 4% of the total purchase price of $2.89 billion.

The largest number of machines were found in the $50,001 to $200,000 price category, accounting for 26% of the total number; however, this represented only 3.1% of the value.

In the mid-range price category – $200,001 to $500,000 – there were 722 systems or 25% of the total number installed, which represented 8.3% of the total value.

The 20% of the systems in the $500,001 to $1.5 million range accounted for 19% of the installed value, while the most expensive category, 18% of the base number, represented 69.2% or $2 billion of the total purchase price within the general management classification.

Interdata Tops Rival Data General In the Field — The Football Field

LONG BRANCH, N.J. – Interdata, Inc. decisively tromped Data General Corp. 14-6 in the second annual Data Bowl flag football game played here recently.

The victory marked the second successive year Interdata won the game, and the large trophy donated by *Modern Data Magazine* was retained in Oceanport.

Members of the 22-man Interdata team suffered a broken collarbone and a dislocated shoulder during the game at the Long Branch high school football field, which was attended by about 350 spectators.

A Data General spokesman said he had not received an injury report yet. The firm will be looking at films of the game to select next year's quarterback, he added.

Timing for the two 45-minute halves was performed by nothing other than an Interdata 7/16 mini located in the press box.

A program was written with a loop to count down the time, and the console interrupt was used to stop the clock. Second-by-second times were displayed through the hexadecimal display on the console.

Interdata players were urged on by 10 other employees dressed in high school cheer leader costumes as well as baton twirlers and a vigorous kazoo band.

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David Kosko, Digital Test Programmer



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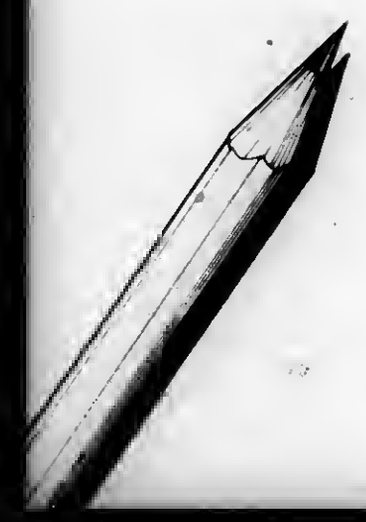
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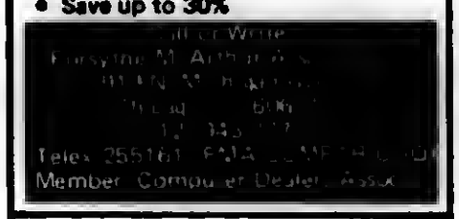
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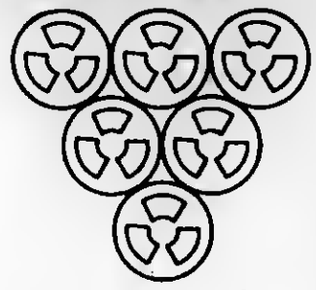
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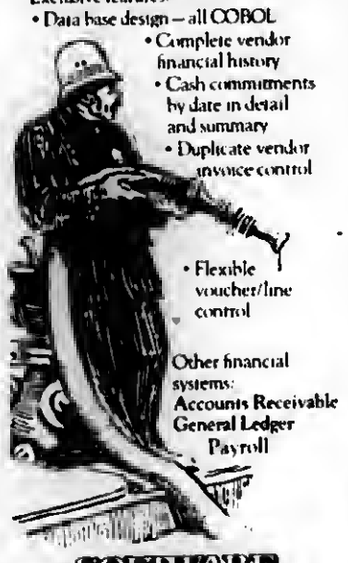
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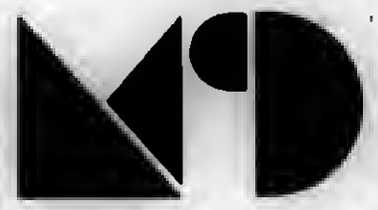
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At CMI, Fabri-Tek

Two Memory Makers Suffer Losses

Two memory makers, Cambridge Memories, Inc. (CMI) and Fabri-Tek, Inc. showed losses in recent statements. In both cases, the comparable year-ago period was profitable.

CMI lost $4.1 million in the year ended Aug. 31 as revenues declined to $18.9 million from $23.1 million last year.

The loss amounted to $2.43 a share compared with earnings of $1 million or 70 cents a share last year.

No Results in Quarter

The firm did not break out fourth-quarter results, but showed earnings during both the six months and third quarter.

"Revenues declined in the fourth quarter because of a lower level of shipments and a lower percentage of sales to operating leases in the mix of shipments," Joseph F. Kruy, CMI president, said.

"Also, fourth-quarter and fiscal year results were adversely affected by year-end adjustments which affected revenues and reserves for inventory and receivables, as well as certain assets and investments related to suspended operations," he added.

Fabri-tek's second quarter showed a loss of $376,000 or 10 cents a share compared with earnings of $126,000 or 3 cents a share in the same period last year.

Revenues declined to $7 million from nearly $8.5 million in the year-ago quarter.

Six Months Loss

For the six months, the firm lost $679,000 or 18 cents a share compared with earnings of $438,000 or 12 cents a share in the previous year's first half.

Six-month revenues fell to $14.6 million compared with nearly $19 million last year.

"A lower volume of sales along with an exchange loss resulting from the decline in value of the British pound are primarily responsible for the loss," according to L.D. Altman, Fabri-Tek president.

"The order picture appears to be firming up and additional cost cutting measures have been taken. We look for an improvement in the third and fourth quarters," he said.

Sale of Facility Boosts Earnings At Ampex $2 Million in Quarter

REDWOOD CITY, Calif. – Ampex Corp.'s second-quarter earnings rose $2 million above the year-ago results, aided in part by the sale of its Marina del Rey facility.

The firm is continuing its program of debt reduction and, as of Nov. 9, had repaid $33 million, bringing its indebtedness, excluding subordinated debentures, to $49.7 million, compared with a high point of $193 million in fiscal 1972.

Include Credits

For the quarter, Ampex earned $3.6 million or 33 cents a share compared with $1.6 million or 14 cents a share in the year-ago period.

The fiscal 1976 results include a $2.4 milion pretax gain on the sale of its Marina del Rey facility compared with a pretax gain of $1 million from the sale of a European facility in the same quarter last year.

Ampex plans to move its Memory Products Division and Data Products Division operations into a new leased facility in El Segundo, Calif. during the middle of next year.

The fiscal 1976 results also include tax credits of $1.5 million compared with $656,000 in 1975.

Second-quarter revenues rose to $66 million from $60 million in the same period last year.

Six-Month Earnings

For the six months, Ampex had operating earnings before special credits and taxes of $6.5 million compared with $4.5 million.

However, including the $13 million settlement received from IBM, Ampex six-month earnings were $5.2 million or 47 cents a share compared with $14.7 million or $1.35 a share in the year-ago period.

Six-month revenues rose to $129.7 million compared with $121.4 million.

Arthur Hausman, Ampex president, said "We are continuing to make progress in reducing our inventory levels through more efficient production techniques. Although sales have increased, our inventory has been reduced by 9% from the end of fiscal 1975."

Scan-Data Earnings Rise in Nine Months

NORRISTOWN, Pa. – Scan-Data Corp. reported increased revenues and earnings for the quarter and nine-month periods ending Sept. 30.

Revenues for the three months rose to $3.1 million compared with year-earlier revenues of $2.5 million. Earnings for the period were $85,139, or 5 cents a share compared with a loss of $29,744 or 2 cents a share in the same period last year.

For the nine-months, revenues grew to $8.2 million compared with nearly $7 million in the year-ago period.

Earnings rose to $191,384, or 11 cents a share compared with $13,452 or 1 cent a share a year earlier.

...Toward the Bottom Line

Computer Automation, Inc., Itel Corp. and Centronics Data Computer Corp. have joined the ranks of dividend payers.

Computer Automation will pay a semiannual dividend of 5 cents a share on Jan. 5 to shareholders of record Nov. 19; Itel paid a quarterly dividend of 5 cents a share on Nov. 28; and Centronics will pay 10 cents a share on Jan. 5 to shareholders of record Nov. 19.

$$$

Greyhound Computer will again omit its dividend on common, as it has since 1973.

$$$

Wang Laboratories, Inc.'s second quarterly dividend this year is 2.5 cents a share payable on Jan. 28, 1976 to shareholders of record Dec. 5.

$$$

IBM paid a regular quarterly dividend of $1.75 per share of common stock Dec. 10.

$$$

EMI Group has agreed to increase its holdings in **Threshold Technology** common stock to about 29%, subject to approval by Threshold shareholders. The transaction would contribute $500,000 to be used for expansion.

$$$

General Computer/Systems has signed a multimillion dollar lease-financing agreement with Citicorp Leasing, Inc. for equipment on leases of three years or more.

$$$

Sycor International Ltd. has received a $2 million line of credit to finance Canadian operations from Chemco Equipment Finance Canada, Ltd.

$$$

Western Digital anticipates its Data Com product line and its LSI-11 microprocessor will be the "key ingredients" of the firm's return to profitability, H.F. Faught, chairman said.

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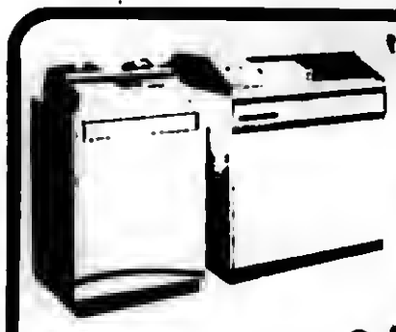
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Earnings Reports

VARIAN ASSOCIATES
Year Ended Sept. 30

	1975	1974
Shr Ernd	$1.11	$1.08
Revenue	310,444,000	293,005,000
Earnings	7,705,000	7,282,000
3 Mo Shr	.31	.30
Revenue	81,080,000	79,564,000
Earnings	2,187,000	2,031,000

ELECTRONIC DATA SYSTEMS
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.29	$.28
Revenue	32,085,000	30,041,000
Earnings	3,518,000	3,359,000

MEMOREX
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.91	$.12
Revenue	66,991,000	56,174,000
Spec Cred	e1,690,000	.....
Earnings	4,364,000	c513,000
9 Mo Shr	2.59	.....
Revenue	194,236,000	158,058,000
Spec Cred	b7,146,000	.....
Earnings	12,163,000	(6,439,000)

e-Tax-loss carryforward. b-Consists of $2.03 million gain on purchase of debentures and $5.12 million from tax-loss carryforward, including $1.88 million related to gain of purchase on the debentures. c-Reflects credit of $.9 million due to reversal of interest expense formerly charged to second-quarter operations.

APPLIED DATA RESEARCH
Nine Months Ended Sept. 30

	1975	a1974
Shr Ernd	$.20	$.06
Revenue	9,356,131	7,540,238
Disc Op	(131,840)	(54,741)
Tax Cred	113,000	254,000
Spec Chg	.....	b411,469
Earnings	240,692	75,976

e-Restated. b-Cumulative effect on prior year from accounting change.

BUNKER RAMO
Three Months Ended Sept. 30

	1975	a1974
Shr Ernd	.....	$.16
Revenue	$70,284,000	79,413,000
Earnings	(2,362,000)	1,613,000
9 Mo Shr	.....	.43
Revenue	218,473,000	238,716,000
Earnings	(1,897,000)	4,474,000

a-Restated.

CINCINNATI MILACRON
aThree Months Ended Oct. 4

	1975	1974
Shr Ernd	$.62	$.70
Revenue	126,486,024	130,089,576
Earnings	2,300,702	2,590,629
9 Mo Shr	1.89	2.45
Revenue	343,390,472	335,693,593
Earnings	7,004,735	b9,013,351

a-Sixteen-week period. b-Includes $1.8 million gain from sale of assets of a division.

COMPUTER NETWORK
Six Months Ended Sept. 30

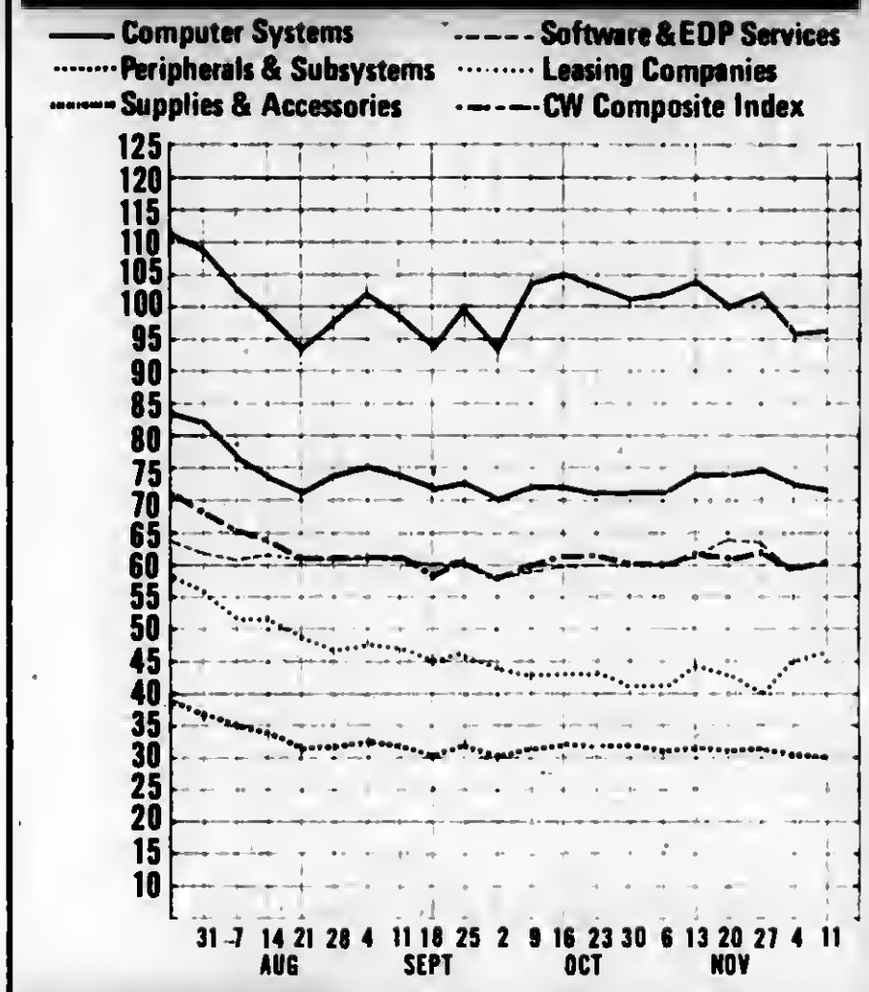
	1975	1974
Shr Ernd	$.66	.....
Revenue	3,650,000	$1,759,200
Tax Cred	370,000	.....
Earnings	766,000	(182,600)

ELECTRONIC ASSOCIATES
Three Months Ended Oct. 3

	1975	1974
Shr Ernd	$.60	.....
Revenue	7,413,000	$7,142,000
Disc Op	684,000	a(11,750,000)
Tax Cred	768,000	.....
Earnings	1,603,000	(11,805,000)
9 Mo Shr	.80	.....
Revenue	22,803,000	22,386,000
Disc Op	684,000	a(12,183,000)
Tax Cred	1,004,000	.....
Earnings	2,128,000	(11,991,000)

a-Includes $10 million loss from disposal of discontinued operations.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, DECEMBER 10, 1975

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE (1)	CLOSE DEC 10 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	84 1/2	+2 3/4	+3.3
O	COMPUTER AUTOMATION	2- 11	9 3/8	- 1/4	-2.3
N	CONTROL DATA CORP	11- 23	17 1/4	- 3/8	-2.1
N	DATA GENERAL CORP	10- 39	34	+ 7/8	+2.6
O	DATAPOINT CORP	6- 26	21 1/4	-1	-4.4
O	DIGITAL COMP CONTROL	1- 4	1 1/2	- 1/4	-14.2
N	DIGITAL EQUIPMENT	46-140	126 3/8	- 7/8	-0.6
N	ELECTRONIC ASSOC.	2- 3	1 7/8	- 1/8	-6.2
A	ELECTRONIC ENGINEER.	3- 10	7 1/2	0	0.0
N	FORBORO	23- 42	27 3/8	+ 3/8	+1.3
O	GENERAL AUTOMATION	4- 14	6	+ 5/8	+11.6
O	GPL COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	38-120	94 1/2	+ 3/4	+0.7
N	HONEYWELL INC	22- 40	32 3/8	- 1/4	-0.7
N	IBM	138-226	217 1/2	-1 1/2	-0.4
O	NEMPEX	1- 10	7 1/2	- 1/4	-3.2
O	NICRODATA CORP	2- 9	8 1/2	+1 1/8	+13.2
O	MODULAR COMPUTER SYS	5- 19	10	+ 3/4	+8.1
N	NCR	15- 39	21 1/2	- 1/2	-2.2
O	PRIME COMPUTER INC	2- 6	3 3/4	0	0.0
N	PERKIN-ELMER	16- 33	22	0	0.0
N	RAYTHEON CO	26- 39	43	- 3/4	-1.7
N	SINGER COMPANY	9- 17	9 3/4	- 1/8	-1.2
N	SPERRY RAND	26- 49	38	-1 3/4	-4.4
A	SYSTEMS ENG. LABS	1- 3	4	+ 3/8	+10.3
N	VARIAN ASSOCIATES	7- 18	12 3/4	+ 3/8	+3.0
N	WANG LABS.	7- 17	10	+ 1/8	+1.2
N	XEROX CORP	47- 86	49 1/4	+2	+4.2
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	3 7/8	0	0.0
A	COMMERCE GROUP CORP	2- 4	2 1/4	- 1/8	-3.2
A	COMPUTER INVSTRS GRP	1- 2	3/4	0	0.0
N	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	0- 1	3/8	+	+16.7
N	DPF INC	3- 6	4 1/2	+ 1/8	+2.8
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 3	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 5/8	0	0.0
N	ITEL	3- 9	3 3/8	- 1/8	-2.2
N	LEASCO CORP	4- 8	3 7/8	+ 3/8	+6.8
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	3/8	- 1/8	-23.0
A	PIONEER TEX CORP	2- 7	3 1/4	+ 1/2	+10.3
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	7 1/8	+ 1/8	+1.7

EXCH		1975 RANGE (1)	CLOSE DEC 10 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	1	+ 1/8	+14.2
A	APPLIED DATA RES.	1- 10	1 1/4	0	0.0
N	AUTOMATIC DATA PROC	29- 63	53 3/8	+1 3/8	+2.6
O	BRANCON APPLIED SYST	1- 1	1/8	0	0.0
O	COMPUTER DIMENSIONS	2- 6	3	- 1/4	-7.6
O	COMP ELECTION SYSTMS	3- 7	3	0	0.0
O	COMPUTER HORIZONS	1- 1	5/8	0	0.0
O	COMPUTER NETWORK	1- 3	1 7/8	- 3/8	-16.6
N	COMPUTER SCIENCES	2- 6	3 3/8	- 3/8	-9.3
O	COMPUTER TASK GROUP	1- 1	3/8	0	0.0
O	COMPUTER USAGE	2- 4	2 1/2	+ 1/8	+3.2
O	COMSHARE	2- 4	2 1/2	- 1/8	-4.7
O	CATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	11 3/8	+ 1/8	+1.1
O	INFONATIONAL INC	1- 1	1/4	+ 1/8	+100.0
O	IPS COMPUTER MARKET.	1- 1	3/8	0	0.0
O	REANE ASSOCIATES	2- 3	2 7/8	+ 1/4	+9.3
O	REYCOMP CORP	2- 4	3 1/2	- 3/8	-9.6
O	LOGICON	3- 3	3 3/8	0	0.0
A	MANAGEMENT DATA	1- 3	1 3/8	- 1/4	-15.3
A	NATIONAL CSS INC	6- 14	9 1/4	- 3/8	-6.3
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	11 1/2	- 7/8	-7.0
N	PLANNING RESEARCH	2- 6	2 7/8	+ 1/8	+4.3
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	2- 3	3 1/2	- 3/8	-9.6
O	REYNOLDS & REYNOLD	10- 24	13 3/4	+1	+7.8
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/4	+ 1/8	+11.1
O	TYMSHARE INC	7- 21	17 1/2	-1 1/4	-6.6
A	URS SYSTEMS	2- 4	2 3/4	- 1/8	-4.3
N	NYLY CORP	2- 4	2 7/8	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	7 1/2	- 1/8	-1.6
O	ADVANCED MEMORY SYS	1- 7	3 3/4	- 1/8	-3.2
N	ANPER CORP	3- 7	4 3/4	- 1/4	-5.0
O	ANDERSON JACOBSON	1- 3	1 3/4	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 5	3 1/8	0	0.0
A	BOLT,BERANEK & NEW	5- 13	7	+ 3/8	+5.6
N	BUNKER-RAMO	4- 8	3 7/8	0	0.0
A	CALCOMP	3- 7	3 1/4	+ 1/4	+8.3
O	CANERIDGE MEMORIES	1- 3	2	+ 1/2	+33.3
N	CENTRONICS DATA COMP	7- 23	17 7/8	- 3/8	-2.0
O	CODEX CORP	15- 38	30	-1	-3.2
O	COGNITRONICS	1- 2	3/8	- 1/8	-16.6
O	COMPUTER COMMUN.	1- 2	1	0	0.0
O	COMPUTER CONSOLES	3- 7	3 1/2	- 1/4	-6.6
A	COMPUTER EQUIPMENT	1- 2	1 1/4	0	0.0
O	COMPUTER MACHINERY	1- 2	3/8	0	0.0
O	COMPUTER TRANSCEIVER	1- 2	7/8	- 1/8	-12.3
O	COMTEN	2- 5	3 1/8	- 1/4	-7.4
N	COMRAC CORP	12- 30	26	+ 3/4	+2.9

EXCH		1975 RANGE (1)	CLOSE DEC 10 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	3- 16	3 3/4	- 1/4	-2.7
A	DATA PRODUCTS CORP	2- 6	3 5/8	- 1/8	-3.3
O	DATA TECHNOLOGY	1- 3	1 1/4	0	0.0
O	DATUN INC	1- 2	1/2	- 1/8	-20.0
O	DECISION DATA COMPUT	2- 7	2 7/8	+ 1/8	+4.3
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DIVAN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & N	1- 3	1 1/8	- 1/8	-10.0
O	FABRI-TEK	1- 1	3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 2	2 1/4	0	0.0
N	HAZELTINE CORP	3- 6	3 1/8	+ 1/8	+4.1
N	HARRIS CORP	18- 33	29 1/4	+ 3/8	+1.2
A	INCOTERM CORP	3- 12	8	+ 1/4	+3.2
O	INFORER INC	2- 3	2 3/8	- 1/8	-3.0
O	INFORNATION INTL INC	8- 14	9 3/4	- 7/8	-8.2
A	LUNOY ELECTRONICS	3- 6	3	+ 3/8	+8.1
O	NANAGENENT ASSIST	1- 1	1/2	0	0.0
A	NILGO ELECTRONICS	8- 24	14 1/8	-1 1/8	-7.3
N	NOHAWK DATA SCI	1- 3	3 1/4	+ 1/2	+18.1
O	OPTICAL SCANNING	1- 3	1 7/8	0	0.0
O	PEARL CORP	2- 2	1	0	0.0
O	PERTEC CORP	2- 8	3 1/2	- 1/4	-6.6
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1/2	0	0.0
O	QUANTOR CORP	2- 6	4 1/4	+ 3/8	+9.6
O	RECOGNITION EQUIP	2- 9	3 3/8	+ 1/4	+4.8
N	SANDERS ASSOCIATES	3- 11	6 1/8	- 3/8	-3.7
O	SCAN DATA	1- 3	1 3/4	+ 1/4	+16.6
O	STORAGE TECHNOLOGY	6- 17	10 3/8	+1	+10.6
O	SYCOR INC	5- 22	16 1/4	-1 1/4	-7.1
O	T BAR INC	3- 6	6 1/4	0	0.0
O	TALLY CORP.	1- 3	2 1/2	0	0.0
O	TEC INC	1- 4	1 3/4	- 1/4	-12.3
N	TERTRONIX INC	18- 43	44	+2 3/4	+6.6
N	TELEX	1- 3	2	- 1/8	-3.8
O	WANGCO INC	4- 9	7 1/2	+ 1/8	+1.6
O	WILTER INC	1- 4	1	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 3	4 1/4	- 1/4	-3.3
A	BARRY WRIGHT	3- 7	3 1/2	- 1/8	-2.2
O	CYBERNATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	30	-1 1/4	-4.0
O	DUPLEX PRODUCTS INC	12- 23	17	0	0.0
N	ENNIS BUS. FORMS	5- 7	3 1/4	- 1/4	-4.3
O	GRAHAM NAGNETICS	5- 10	8 3/4	0	0.0
O	GRAPHIC CONTROLS	8- 21	12	- 1/2	-4.0
N	3N COMPANY	43- 68	37 3/4	- 3/4	-1.2
O	MOORE CORP LTD	39- 31	43 3/4	-1	-2.1
N	NASHUA CORP	9- 22	9 1/2	- 3/8	-3.7
O	STANDARD REGISTER	11- 20	16 1/4	+ 1/4	+1.5
O	TAB PRODUCTS CO	4- 8	4 1/2	- 1/2	-10.0
N	UARCO	17- 24	20	+ 1/4	+1.2
O	VANIER GRAPHICS CORP	4- 7	4 3/4	0	0.0
A	WABASH NAGNETICS	3- 3	3 3/8	0	0.0
N	WALLACE BUS FORNS	15- 23	18 1/2	+ 1/4	+1.3

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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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NEWSPAPER

News Update

Judge Denies Motion To Reverse Catamore

By Molly Upton
Of the CW Staff

PROVIDENCE, R.I. – The next round in the IBM vs. Catamore Enterprises, Inc. case will take place in Boston before the First Circuit Court of Appeals, following Judge Raymond J. Pettine's denial of an IBM motion which asked the judge to overturn the jury verdict awarding Catamore $11.4 million or order a new trial [CW, Nov. 12].

Pettine postponed a decision on Catamore's request for interest and costs and denied Catamore's motion for sanction against IBM counsel.

"We are disappointed our motion for a judgment notwithstanding the verdict or for a new trial has been denied," an IBM spokesman said.

"We feel the jury verdict was contrary to the evidence and the law and will appeal to the U.S. Court of Appeals for the First Circuit," the spokesman said.

In his 13-page ruling, Pettine indicated counsel for IBM had requested him to "look beyond the record and overturn the jury verdict based upon the court's

(Continued on Page 2)

Airtrans to Run Again At Dallas/Fort Worth

By Patrick Ward
Of the CW Staff

FORT WORTH, Texas – The Dallas/Fort Worth Airport Board and LTV Aerospace Corp. have settled their differences, and the airport's automated passenger trains should be back in service in mid-January, according to an airport spokesman.

The Airtrans system, which depends on a minicomputer for supervisory control, has been idle since March [CW, Nov. 26].

LTV had stopped work to protest the Airport Board's decision not to accept the system. The Airport Board and eight airlines said Airtrans failed to live up to contract specifications.

The airport and airlines and LTV launched suit and countersuit against each other amounting to almost $1 billion in total.

The settlement calls for the airport to accept the current Airtrans system and to pay LTV $7 million in damages.

LTV, in turn, will deliver a Modular Computer Systems (Modcomp) II to back up the Airtrans' Modcomp III central control computer. LTV also agreed to provide additional technical services and training.

(Continued on Page 4)

For Violating Civil Rights

Police Sued; Outdated NCIC File Cited

By Nancy French
Of the CW Staff

CONCORD, N.H. – Failure to update a record in the National Crime Information Center's (NCIC) wanted persons file has resulted in a lawsuit against seven policemen.

William A. Smith, a 25-year-old Dover man, claimed he was "roused" from bed, taken to the local police station and questioned for four hours by police who said his name matched an alias in the NCIC file.

Smith filed suit in U.S. District Court here seeking $75,000 in compensatory damages and $25,000 in punitive damages against three police officers from Durham, three from Dover and one from the University of New Hampshire on grounds his civil rights were violated.

The incident occurred June 1, about six hours after Smith's car was stopped by Dover police and he was issued a defective equipment tag because a tail light on his vehicle was not working.

Apparently his name and date of birth were later teletypewritten to the NCIC in Washington, D.C., and a "hit" was registered.

Police arrived at Smith's residence at about 4:00 a.m., handcuffed him and took him to the Dover Police station where he was photographed, fingerprinted and interrogated for almost four hours, his complaint said.

According to New Hampshire law, police may hold a suspect for four hours without charging him.

Smith said police tried to get him to admit being named "Barnes", the surname of a man who was going by the alias "Bill Smith" and was wanted by the New York police.

Smith, who attended high school in Northwood, N.H., with Sgt. Kenneth Laderbush of the Durham Police Department four miles away, claimed Laderbush could have identified him. The police officers involved, however, refused to telephone Laderbush or permit Smith to telephone anyone, Smith said.

No apparent effort was made to verify whether the "Bill Smith" sought by New York police was still at large, Smith also claimed.

It was later learned police had picked up the New York man before June 1, the

(Continued on Page 4)

McGill Indicates AT&T Gearing For Industry-Oriented Products

By Ronald A. Frank
Of the CW Staff

NEW YORK – AT&T's Transaction Telephone is probably the first of many terminal devices tailored to solve the problems of a specific industry.

But even this terminal device can be classified as a technology-driven development rather than a customer problem-solving type of device, according to Archie McGill, director of market management at AT&T.

If the Bell System is to be effective in solving users' needs, it will have to understand what the users' problems are and, in order to find out, McGill has set up an industry marketing organization patterned very much after IBM's.

The goal of this group is to first define user needs and then develop those needs into a product that will allow the user to optimize his solution as well as derive maximum use out of the telephone network, McGill said in an interview.

McGill feels the Transaction Telephone is only "a piece of the solution" because it also needs a network, a data base and the switch to solve the customer's problem. The device is based on capabilities developed outside the Bell System rather than being part of an overall phone company solution, he said.

"We don't have to provide the data processing machine, but we have to understand how the data processing machine relates to the total problem," he said.

While IBM puts its DP boxes at customer sites, the phone company has the ability to put its boxes at Bell installations in order to provide needed capa-

(Continued on Page 4)

Navy Team Defines Hypo-Cobol, Ansi Variant for Small Systems

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – A working definition of Hypo-Cobol, a variant of the 1974 American National Standards Institute (Ansi) Cobol specifications intended for small systems, has been completed by a U.S. Navy team and will be available soon from the National Technical Information Service for review and comment.

Though "reasonably happy" with the definition as it stands, developer George Baird of the Navy's Automatic DP Equipment Selection Office (Adpeso) said recently he and his coworkers "very definitely" want feedback so problems can be recognized – and, hopefully, cured – to prevent their inclusion in the language.

Organizations are free to reproduce the Hypo-Cobol definition and to build compilers from its specifications, according to Baird. The Federal Cobol Compiler Testing Service has already developed audit routines with which to validate Hypo-Cobol implementations.

Once the definition is finalized, it will apparently become part of the Federal Information Processing Standards (Fips), which sets rules under which data processing is done by government agencies.

Because of the size of the government's DP operations, these standards are likely to have a "ripple effect" on nongovernment users as well, observers have noted.

Hypo-Cobol is a proper subset of the full 1974 Ansi specifications, Baird emphasized. Most of the elements selected for inclusion are required in any imple-

(Continued on Page 4)

Notice to Subscribers

The next issue of *Computerworld* will be a combined issue and will be dated December 31-January 5.

With that issue, CW will be making the transition from Wednesday dating to Monday dating in order to better reflect the timeliness of the publication.

FAA Has Gift for Travelers— DP-Based Collision Alert System

By John Hebert
Of the CW Staff

WASHINGTON, D.C. – The Federal Aviation Administration (FAA) is giving a belated Christmas present this year – in the form of a computerized aircraft collision warning system – to all people who travel by air.

The FAA is installing a Conflict Alert System (CAS) into all 20 Air Route Traffic Control Centers (ARTCC) in the continental U.S.; all of the centers should have the system by Jan. 1, according to an FAA spokesman.

The CAS should serve to reduce the number of near collisions in midair, such as the recent incidents involving passenger and general aviation aircraft flying too close to one another in the Chicago and Cleveland airspaces, the spokesman indicated.

The alert system was developed by the Mitre Corp. of McLean, Va. and was coded by IBM Corp. for integration into the IBM 9020 CPU-based systems in ARTCCs [CW, Oct. 29], the spokesman said.

The CAS is capable of recognizing what the flight path of an aircraft will be in two minutes, if the plane is equipped with an altitude-reporting transponder, he said.

This allows enough time for a controller to instruct the aircraft in conflict to assume another flight path, he indicated.

When even a remote possibility of conflict in flight paths is calculated by the alert system, the alphanumeric displays representing each aircraft on the traffic

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Discrimination Suit Focuses on DP Tapes

By Catherine Arnst
Of the CW Staff

MINNEAPOLIS – Computer tapes containing personnel data have become a controversial issue in a race- and sex-discrimination suit brought by Marceline Donaldson against Pillsbury Co.

Pillsbury has refused to provide the tapes to the plaintiff because "the computer tapes per se are not relevant to the case," according to a lawyer involved in the company's defense.

However, "our feeling is that they have something to hide," Percy Julian, attorney for Donaldson, said.

Donaldson filed suit in May 1974 claiming she was fired from Pillsbury on the basis of racial and sexual discrimination.

She believes that her allegations of bias can be substantiated by information on the tapes and that patterns of hiring and promotion would be revealed by an analysis of the data.

Under the procedures for discovery, Julian requested information concerning computer tapes for a two-month period so he would know which specific tapes to request. The company refused to provide this information and asked the court that it be allowed to destroy the tapes.

Pillsbury said that the facts on the tapes had already been made available to the plaintiff in hard-copy form and that the material on the semimonthly tapes are redundant since the information is back-up to that on year-end tapes.

The company sought to modify an injunction handed down in May 1974 prohibiting it from destroying any tapes and documents pertinent to the case. Pillsbury said the tapes are expensive to store and could be reused, "sparing ourselves some modest expense," a defense attorney said.

"It's not valid that the tapes are hard to store," Julian said. "We offered to store the tapes for them under lock and key."

The preservation of the semimonthly tapes is important, he added, because the records of some employees who work for only a short time might not be included in the year-end tapes.

"Our contention is that we don't know what's on the tapes," Julian said. "We at least want to look at them and see if we agree.

"Pillsbury said we already had the information which we would ultimately seek, which simply isn't true," he said.

Protracted Long Enough

The company said the trial had been protracted long enough and should go to trial as soon as possible. "We are anxious to have it decided," a defense attorney said.

"Hundreds of pages of documents have already been provided," he continued. "The company has incurred a lot of expense already on the case. It would cost the company literally tens of thousands of dollars to copy the tapes and to educate on how to use them properly," he said.

A 1970 amendment to Rule 34 of the Federal Rules of Civil Procedure concerning the procedures of discovery stated: "The inclusive description of documents (which can be requested) is revised to accord with changing technology. It makes clear that Rule 34 applies to electronic data compilations from which information can be obtained only with the use of detection devices . . . In many cases this means the repondent will have to supply a printout of computer data . . . (or) the electronic source itself."

However, the amendment also stated that "the courts have ample power . . . to protect the repondent against undue burden or expense either by restricting discovery or requiring that the discovering party pay costs."

"It is so crystal clear that the tapes should be handed over," Julian said.

"We could not prepare the case properly without the tapes," he concluded.

ACM Nominators Fail to Name Vice-President to Presidency

NEW YORK – Nominations for officers of the Association for Computing Machinery (ACM) for 1976-78 broke with tradition when, for the first time in a decade, the group's vice-president was not nominated to succeed to the presidency.

Nominees for the presidency include Peter Denning, professor at Purdue University, and Carl Hammer, director of computer sciences at Univac.

Vice-presidential nominations went to Stuart Lynn, professor at Rice University, and Eric Weiss of Sun Oil Co.

George Dodd of General Motors Research Laboratory and Bruce Van Atta, professor at the University of Rochester, were nominated for secretary.

The nominating committee, chaired by Anthony Ralston, did not nominate Dr. Herbert R.J. Grosch, the incumbent vice-president, for the presidency, marking the first time this had happened since 1966.

Selections were chosen by looking "at the spectrum available and choosing the best qualified," Ralston said.

Petitions are currently being circulated to place Grosch in the running for the 1976-78 presidency, according to Grosch.

The candidates will be voted on by all members of ACM except student and associate members and all ballots must be in by April 25. Those elected will take office at the end of June for a period of two years.

Judge Denies Motion

(Continued from Page 1)

understanding as to what meets the minimally acceptable standards of the general business community's profit projections.

"Such standards are not subject to judicial notice," Pettine remarked.

"Furthermore, I note IBM had ample opportunity and resources to present these same arguments with supporting testimony to the court and subsequently to the jury. I find nothing now properly before me for my consideration which would cause me to alter my earlier ruling on the admissability of these projections and I reaffirm them," he said.

Catamorc clearly acknowledged duplication of damages throughout the course of the trial, he added.

Thomas K. Christo, lead attorney for Catamore, said "we are pleased the trial judge in his reasoned opinion agrees with us that the jury verdict was supported by the evidence and look forward to similar result should IBM decide to prosccute an appeal."

Young, Affluent Consumers Most Likely EFTS Customers

WEST LAFAYETTE, Ind. – Young, affluent, sophisticated consumers will be the most likely customers of cashless, checkless, electronic funds transfer systems (EFTS), a report by Purdue University's Credit Research Center said.

This relatively small segment of the U.S. population accounts for a significant portion of the nation's money transactions, according to the survey.

Principle concerns raised by survey respondents include what EFTS will cost the consumer in convenience, accuracy and expense. Further: Can EFTS be trusted to protect personal information, stay accurate and assure the consumer control over his transactions?

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Law Amends 1903 Expediting Act

Tunney Bill Could Prolong U.S. vs. IBM by Two Years

By Edith Holmes
Of the CW Staff

NEW YORK – U.S. vs. IBM could remain in the courts up to two years longer than exepcted because of a law passed last year.

Most will remember that law as the Tunney bili which, when it became the Antitrust Procedures and Penalties Act, made the public review of proposed consent decrees law.

But most people don't realize that embedded in that law is a section which could keep antitrust cases brought by the U.S. government in the courts for a longer period of time.

In addition to requiring the government to draw up and file with the district court hearing an antitrust case a statement expiaining the competitive impact of a proposed consent decree and allowing a 60-day period for the public to comment on that statement, the law approved by Congress last Dec. 21 also amends the Expediting Act of 1903.

Passed when the appellate courts were both unfamiliar and untried, the Expediting Act allowed any antitrust case brought by the government to be appealed directly from a federal district court to the Supreme Court. The act was passed to speed up the settlement and relief of cases generally believed to have considerable impact on the public good by eliminating the necessity of an appeals court hearing.

Last year's amendment to the Expediting Act made appellate review between the district court and Supreme Court levels a normal course of procedure. Antitrust cases brought by the government can still go directly to the Supreme Court, but only if the U.S. Attorney General certifies that the case is crucial to the public's welfare. The Supreme Court must then decide to hear the case on that basis as well.

If the Supreme Court does not accept the Attorney General's certification of the case, the case is returned to the appeals court serving the district in which the case was originally tried. The appellate court hears the suit, which may later be appealed to the Supreme Court.

The amendment to the Expediting Act contained in the Antitrust Procedures and Penalties Act is intended primarily to relieve the Supreme Court of the case load it faces these days and to allow the appeliate courts to refine what the high court must hear of the original, often voluminous trial record.

Interestingly enough, the Computer Industry Association (CIA), which attended the hearings on the Tunney bill and approved of its measures regarding public scrutiny of consent decrees, did not comment on this portion of the act.

The CIA did indicate its concern "that the consent settlement process not be made so litigious that advantages of flexibility, expedition and efficient use of manpower are lost."

Had CIA officials read further into the proposed law, one wonders what comment they would have made regarding the amendment to the Expediting Act.

Edelstein Puts His Foot Down

NEW YORK – In an unprecedented evening session of U.S. vs. IBM here recently, the judge hearing the antitrust case told counsel for the government and the corporation he would keep them all night if that was necessary to complete the testimony of the witness then on the stand.

"I intend to finish with Mr. Ingersoll tonight," Judge David N. Edelstein said, gesturing toward John Ingersoll, a vice-president with General Electric Corp. (GE) and at one time associated with GE's computer business.

"You indicated we would finish with this witness by 4:00 this afternoon," he said, adding that the case is progressing far too slowly and that it is time both parties started living up to the schedules they set.

Accordingly, the court recessed for dinner, resumed at 5:30 and suspended for the day at 9:30 when Ingersoll's testimony was completed and he was excused from the stand.

Of the principal participants in the case, only Thomas D. Barr, lead IBM attorney from the firm of Cravath, Swaine and Moore, was absent from the courtroom during the evening session.

Edelstein Comments

Edelstein made more comments during those few hours than he has for the past month concerning the appropriateness of objections to evidence and testimony presented by both sides.

At one point he told attorneys for the government and IBM, "I don't want to run out of patience in this case," suggesting that they sharpen every aspect of their presentations to the court.

"I still have some discretionary power, and I intend to use it," Edelstein continued. "I'm not going to allow the process of attrition to reach excessive heights. . . . I'm not going to allow this to become a game for suppressing the truth."

Study Exonerates DP in Near Collision of Aircraft

By John Hebert
Of the CW Staff

WASHINGTON, D.C. – Results of a preliminary investigation into the causes of a near collision involving two scheduled passenger aircraft about 30 miles northwest of Carleton, Mich., recently indicated there is little, if any, reason to believe the computerized air traffic control system tracking the planes was at fault.

The initial investigation and subsequent public deposition of five air traffic controliers from the Cleveland Air Route Traffic Control Center (ARTCC) and crews of both the Trans-World Airlines (TWA) Lockheed 1011 and the American Airlines (AA) McDonnell Douglas Corp. DC-10 revealed human error rather than computer system error as the direct cause of the near hit, according to a spokesman for the National Transportation Safety Board (NTSB) here.

The occurrence resulted in damage only to the DC-10 (a nonstop flight from Chicago to Newark, N.J.), 10 flight attendants and 14 passengers, with three of the passengers seriously injured, the NTSB report said.

The AA flight was gaining altitude out of O'Hare Airport until it reached 34,953 feet (pressure altitude), at which time an air traffic controlier at the Cleveland ARTCC realized its flight path would directly infringe on the airspace the TWA flight from Philadelphia was coursing on an opposite heading.

Urgent Order

The DC-10's pilot was given an urgent order from Cleveland ARTCC to "descend immediately to 330 [33,000 feet], according to the NTSB preliminary report.

"According to [the DC-10's] Digital Fiight Data Recorder (DFDR) information, the highest altitude reached by AA 182 was 34,953 feet (pressure altitude) followed by a descent to 33,000 feet in about 32 seconds. The TWA 37 DFDR showed that the aircraft was cruising at a pressure altitude of 35,000 feet," the NTSB preliminary report said.

Upon further investigation, in the form of the public deposition, an NTSB spokesman has said that deposition testimony taken indicated evidence only of human error.

Controller 'Preoccupied'

Apparently, when the two scheduled jets were heading into their collision course, a Cleveland air traffic controller "became preoccupied" with attempting to enter flight plan information of a third aircraft, a Lear Jet, into the computerized system, the NTSB spokesman said.

The controller was said to have taken about two minutes to enter the flight plan into the terminal, when he should have given the information to a manual operator.

After the information was entered, the controlier was relieved by another controller, who was not briefed on the progress of the DC-10, the spokesman added.

Approximately 6-1/2 minutes later, the rellef controlier realized the danger of imminent collision and reported his command to descend to 33,000 feet to the pilot of the DC-10, who immediately responded by plunging the aircraft into a 35-degree dive.

Full results of the NTSB investigation may take several weeks to complete, the NTSB spokesman said.

Testimony on Statistics

In response to the recent rash of close calls, the Congress called an open session last week to hear testimony on Federal Aviation Administration (FAA) statistics related to this problem by Dr. John L. McLucas, adminstrator of the FAA, a spokesman said.

During the question-and-answer period following the testimony, it was discovered there were 207 incidents of near collisions reported to the FAA from the beginning of this year through October, he said.

Human Error Cited

Of these, 32 involved aircraft operating under air traffic control – under the control of automated radar systems – and all 21 incidents occurred because of human, rather than computer system error, the spokesman explained.

In addition to the Congressional inquiry, the NTSB is considering whether it should conduct a full investigation of the causes of so many close calls, an NTSB source said.

FAA Readies Present For Air Travelers

(Continued from Page 1)

controller's Raytheon radar scope flash until evasive action is taken by pilots of the collision-course aircraft, the spokesman said.

The system has a capability of covering aircraft above an altitude of 18,000 feet only, he added.

Test programs are being conducted at four ARTCCs to add greater capabilities to the CAS, allowing it to respond to craft above an altitude of 12,500 feet under radar conditions, the spokesman added.

This program should be operational in about 2-1/2 months, the spokesman said.

A CAS would have avoided the near collision between a DC-10 and a Lockheed 1011 carrying a total of 308 passengers that occurred late last month near Carleton, Mich., he indicated.

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U.S. Puts Teeth Into Cobol Validation Requirements

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – The biggest DP user of all – the U.S. government – has now told suppliers what Cobol compilers it will accept, what they have to do to prove proposed compilers are acceptable and what will happen if their compilers are defective.

The message: shape up or get lost.

That message was contained in an amended Federal Property Management Requirement (FPMR) published in November by the General Services Administration.

Cobol was defined as the language for business-oriented government DP work while the 1968 American National Standard (ANS) specifications were still in force. Later "Federal Information Processing Standard Publication 21" (Fips Pub 21) was revised to name the 1974 ANS specifications as the proper base.

Now the FPMR has specified the Federal Cobol Compiler Testing Service (FCCTS) and its audit routines as the means of validating compilers coming into the federal inventory.

In addition, the Cobol Interpretation Committee set up by the National Bureau of Standards has been named arbiter of any "unresolved questions and/or ambiguities" remaining after FCCTS has run its test.

12-Month Response Time

Defects spotted by FCCTS in a proposed compiler must be corrected by the vendor within 12 months – or any shorter period the request for proposal (RFP) may specify – or any subsequent attempts to propose the defective compiler in any government bid "shall be considered nonresponsive."

Responses to unfavorable decisions from the Cobol Interpretation Committee must also be met within those time limits or later bids including the compiler will – again – be considered "nonresponsive."

According to the FPMR, every RFP with a Cobol requirement must state the implementation level required, according to the four-level definition contained in "Fips Pub 21-1." Vendors must specifiy in their responses what level their compilers meet.

Bids can be considered on that basis, but "all Cobol compilers coming into the federal inventory shall be validated," the new regulation said. And FCCTS must be used as the validating agency.

When a vendor asks FCCTS to validate a compiler, the requester is responsible for providing the necessary test facilities. The validation is performed on a cost-reimbursable basis, but the requester is provided an estimate of costs before any FCCTS work is done.

At the end of its testing cycle, FCCTS will provide a Validation Summary Report (VSR), the amended FPMR noted. These summaries may be used by the vendor in conjunction with subsequent proposals offering the same compiler, an FCCTS spokesman noted later.

VSRs are available from the National Technical Information Service in Springfield, Va., for most of the compilers that have been through the validation process.

This means users anywhere can find out how well various compilers measure up to objective standards, if they have been measured at all, he noted.

By the same token, ready availability of VSRs might encourage vendors to have their compilers checked out and the capabilities summarized or face the prospects of users wondering why the compilers haven't been tested.

Navy Team Defines Hypo-Cobol Subset

(Continued from Page 1)

mentation of a low-level Cobol compiler as defined in Fips publication 21-1, he acknowledged, but Hypo-Cobol does not contain all the low-level elements and does contain selected elements from higher level implementations.

The effort to define Hypo-Cobol was prompted by a perceived need for a small-scale package that could exist in minicomputer and time-sharing environments which impose resource limitations too severe for "normal" Cobol compilers, he explained.

A version of Cobol was needed which could provide basic capabilities without making extreme demands on system resources at compile time. Hypo-Cobol was designed to reduce the size of the compiler and its related work areas and to eliminate redundancies in the conventional language statements, he added.

By eliminating optional words, the reserved word list is decreased and other grammatical structures are substantially reduced in size, resulting in commensurate reductions in storage requirements and in compile time needed for parser actions, Baird continued.

Cutting out functionally redundant statement formats or options provides the same benefits as reducing the reserved word list, he noted. Beyond that, Hypo-Cobol places limits on all statements where ellipses exist, so the maximum size of a statement is fixed.

Limits User-Defined Names

In another move to reduce time and storage but with a potential impact on the readability of the user's source code, Hypo-Cobol also limits the size of user-defined names to no more than 12 characters. Full Cobol normally allows 30-character names.

Working with Adpeso on the definition of Hypo-Cobol were personnel from the Navy's Programming Standards Section, Capt. Grace Hopper's organization. It took the team just under 200 hours to extract those portions of the 1974 Ansi specifications it felt useful for Hypo-Cobol.

For various reasons, no elements were included from the Indexed I/O, Sort/Merge, Report Writer, Segmentation, Library or Communications modules, Baird noted.

The current definition can be ordered from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161.

Comments about Hypo-Cobol should be sent to Baird at the Software Development Section, Adpeso, Department of the Navy, here in Washington, D.C. 20376.

Deputy Showing Off Terminal Learns He Shouldn't Tempt Fate

GARLAND, Texas – Never aet as the guinea pig when you're demonstrating a new computer system because you never know what that system will turn up, lawmen often warn.

Dallas County Sheriff's Deputy Larry Guinn learned that lesson the hard way recently when a new computer terminal he was showing off revealed he has been carrying a stolen gun for three years.

The gun has since been returned to its rightful owner.

Guinn, who retrieves and enters information on suspects and stolen property in the National Crime Information Center's (NCIC) computerized file, was showing how the system works on a terminal in the Garland Police Department recently and decided to use the serial number of his own Smith and Wesson .38-caliber revolver in the demonstration.

He keyed the number into the terminal as observers looked on.

Much to everyone's amazement, the terminal reported the gun was stolen on July 3, 1972 from a Dallas man.

"All I could say was 'uh well, now you know what a real hit looks like,' " Guinn said.

A "hit" is an indication that a person being checked on is wanted by authorities or that property being checked is stolen.

The Dallas police traced the weapon's original owner to his new home in Houston and the gun was returned.

The dealer from whom Guinn bought the weapon for $92.50 claimed he didn't know the gun was stolen. He said he sold it in good faith and refused to replace it.

Guinn vowed that, in the future, he'll check the serial number of any weapon he's interested in against the NCIC file before he buys it."

Outdated NCIC File Results in Lawsuit

(Continued from Page 1)

date of the New Hampshire incident, but failed to update the NCIC wanted persons file.

After being held nearly four hours, Smith said he was only too happy to sign a waiver exonerating the police from any guilt in the case in exchange for his freedom.

Smith also charged the police with acting "willfully, knowingly and with specific intent to deprive him of his rights of freedom from illegal searches and seizures of his person and effects and of his rights of freedom from unlawful arrest, detention or imprisonment."

Further, Smith charged the police with entering his house "without any warrant or probable cause."

Police refused to comment on the case.

The defendants in the case have 20 days to answer the complaint. A pretrial hearing will be set 30 to 60 days later.

McGill Indicates

AT&T Gearing Toward Industry-Oriented Products

(Continued from Page 1)

bility to users, he added.

Asked whether Bell is planning any type of packet-switched services for data users, McGill said this is certainly one of the possibilities but would not be more specific.

He did say, however, that the communications world is going digital and in this context data, voice and other communications modes can be substituted for one another with ease in a digital transmission system.

Interface May Change

One area that may change as Bell introduces new equipment is the man-machine interface. Up to now AT&T has looked at its network from "phone-to-phone or modem-to-modem," but easier ways will have to be found for the user to communicate and move his information, McGill said.

In this regard, if a non-Bell supplier has developed a capability that would lend itself to a telephone company device or service, he would encourage that the outside capability be incorporated into the Bell offering, McGill said.

One industry being studied intensively by his organization is banking and the entire electronic funds transfer area, McGill said. He indicated any equipment designed to handle such transactions might also be able to record Stock Keeping Unit information as part of a point-of-sale capture capability.

"Our orientation is more to the network than to the terminal and, while we will have terminals, our motivation will be to make our system acceptable by many people's terminals," he said.

A "Nothing' Solution

Until now Bell has looked at data communications problems as being solved on a modem-to-modem basis, but this is "a nothing" solution, McGill said. AT&T will have to look at solutions "from a data processor-to-data processor, computer-to-computer, or computer-to-person" basis.

"Then we would have come up with a solution that is transparent to the user," he said.

The Bell system can continue to provide data processing as part of its capability without violating regulatory constraints,



CW Photo by R. Frank

Archie McGill

he said. The Federal Communications Commission's (FCC) Computer Inquiry guidelines allow AT&T to provide hybrid services that are primarily communications-oriented with incidental data processing.

"If the FCC meant putting information over telephone lines and optimizing the cost of that communication," then Bell will have problems providing hybrid services, "but I don't believe that is what the FCC meant," McGill said.

Airtrans to Run Again At Dallas/Fort Worth

(Continued from Page 1)

The main function of the Modcomp III is to "cut down on the number of people required to keep eyes" on the trains, according to Don J. Ochsner, Airtrans manager for the airport.

When the computer went down, extra people had to be called into the control room to fill the gap. The backup Modcomp II should improve this situation, Ochsner said.

Despite its past troubles, Airtrans can handle the job for which it was intended, he added. "We wouldn't be taking it over unless we had confidence in it," he said.

Davis Cites Software Requirements

Federal Agencies Need Procedures for Privacy Act

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – To comply with the Privacy Act of 1974, federal agencies will have to develop procedures and software that allow them to record and control disclosure, assure records are complete and maintain an individual's dispute claims within easy access of the file itself, according to Dr. Ruth Davis, director of the National Bureau of Standards' (NBS) Institute for Computer Sciences and Technology.

The agencies will also need software and procedures to maintain a usage log and verify data periodically to assure it is both accurate and necessary to keep.

In addition, they will also have to assure records are uniquely identified to prevent ambiguity and ensure accuracy.

Finally, techniques will be needed to allow selective access to such files as medical records which, under the act, the government may withhold from data subjects.

Davis presented these views in a paper prepared recently for the Privacy Protection Study Commission, established by the Privacy Act to study the state of privacy in both the public and private sector and recommend future legislation to Congress and the President.

Written Consent Required

Under the law, "agencies must obtain written consent from each data subject for the disclosure of personal data," Davis pointed out.

If permission was obtained at the time the data was collected from the subject for specific purposes, additional permissions must be obtained if the data is to be disclosed for other purposes, she said.

To comply with the law, software and procedures will be needed to generate requests for consent of the data subjects, she said. Software and procedures will also be needed to record and update a data subject's access control information, indicating those uses for which the data subject has given permission.

But even before disclosing personal data, the agency must be able to validate the requestor's authorization to access the requisitioned data.

Disputed Data

In cases where an individual has filed a dissenting claim concerning data presently held on him, that claim must be forwarded to the person or agency requesting his records.

To assure this is done, agencies will need software and procedures to alert them such a claim exists and to retrieve the claim and transmit it to the requesting agency, Davis said.

"The may involve the development of an automated file or the annexation of claims to an existing file," she explained.

Davis suggested that, under guidelines issued by the Office of Management and Budget, an agency could adequately store a subject's claims by flagging the disputed fields in the individual's record and storing the actual statement offline in hard-copy form.

Such data must be stored so it can be retrieved readily whenever the disputed portion of the record is to be disclosed, she noted. In the case of personal data systems supporting on-line disclosure through terminals, this almost requires on-line storage of claims, she said.

Technical Requirements

Davis identified technical requirements for recording an individual's access to records.

One important consideration in storing records about an individual is the "technical linking" of an individual's records in such a way that, if they are retrieved, all data about the individual will be obtained.

If an individual who requests his records finds later he had not received his entire file, he might interpret this as "a deliberate act to circumvent regulations on the part of the agency, whether intentional or not," she explained.

Davis also emphasized the need to identify subjects "uniquely" to prevent ambiguity and ensure accuracy, suggesting in very large files it might be necessary to include such characteristics as parentage, sex, color of eyes and previous places of residence and employment.

Similar considerations apply to assure a person accessing personal records is actually the person he claims to be. "For access to sensitive data, recognition may involve comparison of signatures, fingerprints, voice-prints or facial characteristics," she pointed out.

Davis noted the need to develop a means to selectively access certain records – such as medical records – which the government may withhold from the data subject.

"The impact" of this requirement on recordkeeping is that it may be useful to "encode each separable part of a record according to its legal category of retrievability." Computer programming logic could then be used to control the retrieval of records accordingly," she said.

Good information practices require retrievals, accesses and alternations be accompanied by specifics including time of access, Davis said. This audit trail of activity in the system should be able to answer any questions on what records were accessed or changed.

"If a record is to be changed because the agency has determined it to be in error or because of a normal update, specifically defined technical procedures should be used. These should assure that the change is authorized, that the reason for the change is recorded and that the previous content of the record is retained in archival storage," she said.

These procedures should also assure changes are recorded, she added, noting one of the "most frustrating situations an individual faces in dealing with a recordkeeping system is forcing the system to correct errors in records even after changes have been agreed to."

Finally, to assure recordkeeping systems continue to be valuable, it is necessary to assure the accuracy of data.

One way to do this is to make certain data entered into the system is accurate in the first place. Entry methods employing visual review before entry, such as with a CRT, may reduce errors in this process. Alternately, source documents that are readable, for example hy OCR machines, may also reduce errors, she explained.

Auditing Not Enough to Maintain Confidence

WASHINGTON, D.C. – If public confidence is to be maintained in public and private agencies that handle personal information, techniques are needed to examine and then attest to a system's privacy, security and information management standards.

However, current auditing methodology – the use of techniques of logic and mathematics – does not allow one to prove software actually performs its intended functions in all cases and over all conditions.

These views were expressed recently by Dr. Ruth Davis, director of the National Bureau of Standards' (NBS) Institute for Computer Sciences and Technology, in a report to the Privacy Protection Study Commission.

In auditing a computer system, "the auditor is not primarily looking for a good audit trail . . . he is looking for good internal controls," Davis said, quoting recent DP literature.

Those include about seven different types of controls including organizations control, which is essentially physical computer security and operations management.

Input control, or the assurance data is accurate and error-free, is another and poses a problem for any system "whether the data concerns dollars or criminal indictments," Davis said.

Hardware control, or the availability of memory protect, fail-soft power supplies, memory save procedures to assist in record recovery and restart and maintenance and spare parts to keep a system up, was also mentioned by Davis.

In addition, Davis cited software control, which concerns such items as "the availability of label checking on files. routines which enable records of access of files to be made and use of console interrupt switched to be recorded on a logging printer or tape."

As for program controls, Davis described these as software controls written into application programs. Under this category one may put "reasonableness checks and limit checks that may help prevent errors in input data and detect errors in data manipulation," she said.

Output controls were described by Davis as reviews of reports obtained from the system to ensure all data that needs to be reported is being produced in the correct format and at the correct intervals.

"To the extent that an audit trail is to be demonstrated, the output controls must insure it is there," she said.

Finally, she cited system control, or documentation of the flow of the system from preparation of source documents to distribution of output reports. This is the overall review of whether the data system is carrying out its intended function," she explained.

However, Davis warned the commission, "current methods of auditing data systems cannot be said to be formalized even though they may represent the best practice available."

As an aid in correcting this situation, the NBS is studying program design concepts which reduce the number of total combinations of conditions needed to be examined, as well as file organization and manipulations. It is also examining program testing concepts, among them trace routines that examine the paths taken in program execution.

In addition, the bureau is studying ideas that involve testing programs against a variety of input and parameter conditions and zero defect data entry methods.

Five Universities Form Cooperative To Provide Centralized DP Services

EDWARDSVILLE, Ill. – Cooperation is the key to providing computer services to support instructional and research programs at five universities in this state.

The five institutions, which include Eastern Illinois University, Illinois State University, Sangamon State University, Southern Illinois University at Edwardsville and Western Illinois University, have joined together to form the Mid-Illinois Computer Cooperative (Micc) under the sponsorship of the Illinois Educational Consortium for Computer Services.

Initial funding for Micc has been provided by direct state appropriations. The annual $500,000 grant has allowed the placement of one remote job entry (RJE) terminal and six interactive terminals at each member institution.

The central computer facility located here consists of a Control Data Corp. Cyber 72/14, 12 peripheral processors, four disk drives, a tape unit and associated peripherals.

Each member university has its own local computer installation, ranging from a Xerox 530 to an IBM 370/145, which handles administrative data processing, Jack Thompson, Micc executive director, said.

The Micc facility is primarily used for instructional and research computing, he said, ranging from computer-aided instruction (CAI) and problem solving to interactive statistical services through the statistical programming for the social sciences (SPSS) package.

Using a CDC Kronos operating system, Micc can offer several modes of job processing concurrently: time-sharing, remote batch, local batch and deferred batch.

Files created in the local and remote batch or time-sharing mode are fully accessible during other modes, assuming the proper user number and password are entered through the terminal, Thompson said.

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Editorial

Dear Santa,

Once again, we in the DP department at Flako Air Lines and Storm Door Co. are sending you our Christmas requisition list. We still believe in you, even though several of our previous correspondences were either ignored or perhaps were just lost in the mail.

We know the list is long, but our needs are great and growing every year.

First, as always, we'd like realistic deadlines and better problem definition from our users as a stocking present. If they could ask for what they want the first time – and not after the system has been designed – it would be a great help.

Alternatively, you could fill their stockings with switches and ashes – coal's too valuable this year.

Also high on the list would be adequate budgets. You've helped us with presents of leased equipment, plug-compatible peripherals and software packages in the past, but a shrinking dollar can only go so far, particularly since our friendly computer manufacturers keep raising their rates.

You might consider them on the switches and ashes list too, but please don't tell them we suggested it.

And please help our staff attack real problems and not just dream of pie-in-the-sky elegant answers for which there never was a question. They're all good people – no switches and ashes here – but sometimes they get carried away with the individual trees and don't seem to see the forest.

Besides our everyday problems and requests, we also would like some presents dealing with issues of national importance. For example, we'd really like some answers – and promise to be good all year if we get them – about the U.S. vs. IBM antitrust case. Please attach answers to questions such as "Who's on first?" "Is there a first?" and "Will it ever be over?" to our tree if possible.

Don't tell our boss this, but we'd also like it if you could keep computers out of our private lives. Even on weekends, we can't go to the supermarket without having to figure out those funny coded labels on a can of peas.

Also, Santa, we keep getting computer-generated dunning letters, even after we've paid many a bill. If you would just straighten out that system, we'll always eat everything on our plates – including food from the company cafeteria.

A big package of standards might be nice, too. Last year you left a big box with a shiny ribbon and a tag that said standards, but it was empty. Maybe you could put something in there this year, and we'll promise to be good and recycle our printouts next year.

Well, the list could go on forever – but if you read *Computerworld* every week, you're familiar with most of the items.

But, most important, we would like you to use your influence in the right places so the computer can do some good for us all. We have many problems in this world that could be solved if people would apply the power of the computer more wisely.

Finally – since we're a little short of paper around here and microfilm doesn't work well as cards – would you carry our best wishes for a happy holiday time to all our friends in the computer community. And even to those who aren't very friendly.

Sincerely yours,

Flako DP



'. . . And for You, a Nice Bullet to Bite On'

Letters to the Editor

Reports of Honeywell's Death Greatly Exaggerated by Press

During the past few months there have been numerous articles written about Honeywell, its new policies and its future in the computer business. Only after close inspection, prompted by dramatic headlines, does one come to realize that the majority of the verbiage comes from neither Honeywell nor Honeywell users.

Certainly the opinion and interpretation of "outsiders" is newsworthy, but so are the feelings of those involved or affected; for this reason we felt compelled to air some comments made at a recent meeting of the Honeywell Wisconsin User Group.

If Honeywell is to be criticized concerning its policies, the criticism should be leveled at the method used to disseminate information to its employees and customers.

The confusion, misunderstandings and apprehension generated by the lack of communication showed the method of announcement to be inadequate, to say the least. However, the policies, once explained to each individual user, made sense, and as far as destroying the resale value of Honeywell computers, phrases such as "death rattle" did far more damage than did the policies.

We Honeywell users know that Honeywell will generate, again in 1975, a considerable portion of its income from its data processing operation. We understand that, unlike General Electric and RCA, this represents approximately one-half of Honeywell's total sales.

In addition, Honeywell announced the possibility of acquiring the Xerox Corp. computer base which increased the confidence we users have in Honeywell's intention and ability to stay in the data processing industry.

To paraphrase Mark Twain: "The reports of Honeywell's death are greatly exaggerated!"

John J. Gaffney
President
Honeywell Wisconsin Users Group
Madison, Wis.

Control Over Systems Needed

Frank D. Booth was shot and killed a few days ago by a Florida state trooper after a computer check of the license on Booth's car retrieved the record of a license issued three years previously [CW, Dec. 10].

One wonders what, if anything, will happen to the person or persons who designed the computer system which precipitated this event.

A physician or lawyer who, through a negligent act of omission, caused the death of an innocent person, however indirectly, would be subject to certain investigation and possible censure by his medical or bar association.

Until we in the data processing field have a similar method of policing ourselves, we certainly cannot consider ourselves professionals.

More important, we will have no control over the irresponsible use of systems which can cause irreparable harm to innocent people.

Bob Brown
Atlanta, Ga.

Avoid Source of Suffering

In the Dec. 3 issue, I found myself at considerable odds (again) with Herb Grosch's notions about minicomputers and microcomputers.

I found myself absolutely unable to equate Assembly language and a lack of peripherals with "simplicity" – or, for that matter, with low costs.

The keys to efficiency are not "cheap" and "simple" but "useable" and "suitable."

Grosch has obviously not thought at all about the range of applications he wants performed if he can say that the only good computer is a piece of "pig iron" with a good assembler.

I will spare Grosch a lecture on the state of computing and on why fancier machines can be cheaper and simpler; after all, he is a founding-father type and should know all that.

Laurance Wygant
Chicago, Ill.

'Simple' Not Always 'Suitable'

It seems that hardly a week goes by without a letter from Laurance F. Wygant bemoaning the latest irritation visited upon him by *Computerworld*. Since Wygant prides himself on his logic, he should exercise some by avoiding the source of his suffering, unless . . .

Wygant appears to spend a great deal of time writing letters (no articles, mind you). Doesn't he work? Is he looking for work? Or is this his work?

Adrian Register
Philadelphia, Pa.

Grosch Names EFTS Candidate

Angelino Schuster showed how little he knows about Washington when he suggested I want a seat on the electronic funds transfer system (EFTS) commission [CW, Dec. 10].

I have no more chance of a Nixon/Ford appointment in Foggy Botlom country than Abby Hoffman. Besides, the appointee has to be diplomatic as well as knowledgeable.

The obvious candiate is Paul Armer, recently named head of the American Federation of Information Processing Societies committee in the electronic funds transfer area.

Dr. H.R.J. Grosch
Sunnyvale, Calif.

(Other letters on Page 8.)

Letters to the Editor

Application Requests Total 20,000 at ICCP

The Institute for Certification of Computer Professionals (ICCP) is pleased with the increasing support and interest we are receiving from practitioners, which is recognized and reflected in the press, but must point out an error which appeared in Alan Taylor's Dec. 3 column in *Computerworld*.

Our announcement stated that "this year's *requests* for applications have reached 20,000." We did not state that "20,000 applications had already been received," as reported in Taylor's column.

The number of applications for next year's Certificate in Data Processing (CDP) examination is expected to exceed this year's application count of 2,363.

However, this year's favorable response and the postal strike in Canada dictated an extension in our registration deadline, so the final registration count is not yet available.

Paul M. Pair
Secretary
ICCP
Chicago, Ill.

Logic Prevails

I wish to take issue not so much with the substance of the report from Lisbon [CW, Nov. 26], but with the kicker over it which read: " 'Popular Power' Reigns."

Now that the moderates (also "people") have somehow wrested control from the Communist military faction, we should be informed that logic and reason have prevailed over emotion and might – the latter epitomized in the sobbing paratroopers laying down their arms and relinquishing the last airbase held by the ultraleft.

It is to the everlasting credit of the Portuguese that such a cataclysm has been resolved with the shedding of tears instead of an endless flow of blood and entrails. Not every revolution leads to such a reasonable denouement.

H.K. Spriggle
Collingdale, Pa.

Look for Source

Some of the recent comments concerning NCR really astonished me.

Certainly some computer hardware has plenty of downtime while other equipment has practically none. But, doesn't that hold true for all computer manufacturers?

Maybe Ed Tunstall [CW, Oct. 15] should look for the source of his hardware problem rather than looking at the nameplate on the equipment's "skin."

Now, David McMonigle's letter [CW, Dec. 3] really got my goat! It sounds as if he is impressed with anyone who is unimpressed with NCR.

He should take a closer look at NCR's progress in the computer industry (under President William S. Anderson's leadership). He will probably find the "unpackaged" user will have no more of a rough time than with other manufacturers and less than with some.

Don Peterson
Austin, Texas

Facility Management

Some weeks ago, before we ran the news story on the Seattle facility management bid fiasco [CW, Nov. 12], I got into trouble for the first time with our libel lawyers. How even the most venomous columnist could libel Computer Sciences, my least favorite software house, boggles the mind. But our lawyers said I probably had, so a golden opportunity to memorialize FACT, early Univac software, operations in Huntsville, New York offtrack betting, and other CSC high points melted away.

Today I'm going to be a good boy and take a positive view. After all, I told Wernher facility management was a great idea, when I was bidding for the ABMA/NASA contract back in the Fifties. And I still think it is, if *very* carefully considered.

First of all, there has to be a need. The usual one is current inept operation, but there are many others. The key to von Braun's shop in Alabama was that he had good operation, and lots of mazuma, but could not get enough civil service slots to spend his dough in-house; the solution obviously was to have Generous Electric hire most of the computer lab's people, freeing up fifty or sixty openings and costing only a little more. Hoard for horde, so to speak!

Another common problem is lack of a path for advancement in the parent organization. Especially when there is a small DP shop embedded in a major outfit, or when advancement depends on an M.D. or Ch.E. degree – Badische drove away the best computer operations pioneer in West Germany that way – it may be a fine idea to hire an outside outfit where good people can go up to top management, even though they leave your own facility in the process.

And of course there is always the overwhelmed case, where a vast or brand new computer operation has to be set up overnight.

Financial savings – tightwad mode, I call it – does not generally constitute a sufficient excuse. Certainly, a facility management contract ought to save or, more realistically, promise to save money. But it's sort of a thermodynamic argument, like the one that says more layers of software *have* to slow down a system, that the central overhead and profits of the management firm are extras. Maybe they'll be so much better you'll save enough to cover those extras, but don't count on it.

Above all, the Seattle imbroglio teaches us that the candidates for a contract should be decent and honest. How to write such a requirement into a municipal – or for that matter, a Federal – contract is a *very* nice problem, to which lawyers notably have failed to contribute. But it sure is the key qualification. No matter how expert, no matter how experienced, no matter how frugal, a management company that you cannot trust is a perpetual disaster. In selling GE Phoenix to Huntsville, I stressed the reasonably upright corporate stance as a major attraction (after all, if the civil servants wouldn't switch over, the whole ploy failed). That was before all those vice presidents were sent to jail for Excessive Collusion!

Anyhow, I repeat: first, probity. Expertise, yes. Savings, maybe. Good people, very very high. But first, probity.



Herb Grosch

Multiple Mailings One of DP's Unsolved Problems

The Taylor Report
By
Alan Taylor, CDP



A letter about data processing came to me recently from John Trotter of Los Angeles with a cry for aid and a suggestion.

His cry was to stop him from being buried by multiple mailings from the same sources, and his example was a duplication of invitations for January and February seminars on data base management systems.

Now, multiple mailings may not be one of life's major problems, but they are a problem – and a data processing one, too. The problem is that we have only 24 hours in a day and taking some of this time up unnecessarily is almost a form of stealing it, from the recipient's point of view.

As with too-intrusive phone calls, many people object and will continue to object to duplicate mailings, even though mathematically it could perhaps be shown that their objections concern only a trivial amount of time.

Multiple mailings are a data processing problem for three reaons. Two of these fall under the Salton Rule, which says that errors occurring because of the existence of DP are DP errors, even though they are not committed by computers or computer people.

The DP characteristic of multiple-mailing problems are:

- Mass mailing is a computer phenomenon.

These errors, even though not directly computer-related, occur because computers exist and are used to make the mass-mailing systems much more efficient.

- Mass mailing errors are seen by the recipients as being DP-related.

The addresses, with their hieroglyphic numbers, all-capital printing and uneven lines just cannot be mistaken for anything except a computer product.

- Solving mass-mailing problems is "obviously" within the power of computers.

This is because anyone who is thought to be able to solve a problem is always blamed for not solving it – even though he can't actually solve it and didn't even cause it in the first place.

Address Comparisons

Trotter's letter showed how pervasive the "obvious-solution" factor is. He claimed that even a modest address comparison program would have eliminated the multiple addressing shown (See Figure 1).

The implication is that the people running the Data Base Management Systems Comparative Evaluation Seminars simply don't care about wasting his time – and so are ripe to be punished.

Factually, if unobviously, I don't think his claim is true, if the aim of the mailing system is to be achieved.

Certainly, an address comparison for the Drew Postgrad Medical School at "1647 E 120th St., Los Angeles. Ca. 90059" would find two identically surnamed Trotters, but is J Trotter Prin EDP Analyst" in Building D really "John Trotter"?

Should this modest address comparison program eliminate such ambiguities? That isn't a modest system change; it is a big one, as I think Trotter will appreciate.

But most people will not appreciate it. They will continue to blame computers.

It is against this background of an "obvious" but impractical solution that we should consider the techniques of solving DP problems such as that of multiple mailings.

It is also noticeable that Trotter does not make any reference to the direct mail industry's approach to the problem.

The direct mail people maintain a list of people who don't want to be on any mailing lists. You can write to them, and they will tell all their members to drop you from solicitations altogether.

But Trotter has no objection to being invited to the seminars – he objects only to multiple invitations. So the industry solution doesn't work for him.

Nor does his solution to the problem appear to be appropriate. His idea is to raise postage rates to force address comparisons through economic pressures.

But, as noted above, address comparison itself is not the real solution he has assumed it is. So out goes that solution, at least for the moment.

But the problem doesn't go away, unfortunately. And it really is a DP problem which is no nearer being solved as 1976 breaks than it was when the year began. DP, so far as I can see, has made no progress toward an approach to these Salton-type problems.

My question is, therefore, how can we start handling this type of problem? Is there any way anyone knows about or thinks about that might realistically help DP attack the problem areas it has either caused or aggravated?

If you have any thoughts, please let me know. Thank you. And happy holidays to every one of you.

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BLDG D
1647 E 120TH ST
LOS ANGELES CA 90059
```

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90059P0101                7509 M
JOHN TROTTER
DREW POSTGRAD MEDICAL SCHOOL
1647 E 120TH ST.
LOS ANGELES CA 90059
```

Figure 1. The two addresses shown above were described by Trotter as being "typical multiple mailings which could be eliminated by even a modest address comparison program." Could you design such a program while keeping a mailing system efficient?

Won't Affect Russian Decisions

ACM Resolution on Soviet DPer an Exercise in Futility

The Council of the Association for Computing Machinery (ACM) recently passed a resolution expressing the hope that Dr. Valentin Turchin, a dissident computer scientist, be permitted to leave the Soviet Union to accept a post at Columbia University [CW, Dec. 10].

Gerald Salton, ACM northeast regional representative, does not agree. Part of his dissenting opinion, published in an ACM newsletter, is reprinted below.

By Gerald Salton
Special to Computerworld

Valentin Turchin is a Russian computer expert who for some years has had increasingly serious problems with the Soviet authorities because of political activities with which the government there disagrees. His activities include open support for Andrei Sakharov and other Soviet dissidents and the signing of petitions and appeals of which the Soviets do not approve.

Unhappily for Turchin, he is not as prominent as Sakharov or Solzhenitsyn and thus, instead of being booted out as Solzhenitsyn was, he is being denied the right to exercise his profession and otherwise subjected to harassments of various kinds.

You may ask what all this has to do with the ACM. First, Turchin is apparently an active computer scientist; second, he is an ACM member because an American friend for reasons not entirely clear has recently paid Turchin's ACM dues; finally, Turchin has been offered a post as a visiting scholar at Columbia University, and the Soviet government has up to now refused to let him come.

I cannot go into all the details and ramifications – the backup material furnished to Council in this case covered over 150 pages. Suffice it to say the Council was faced with a resolution "expressing the hope that Dr. Turchin will be permitted to accept the invitation by Columbia University and voicing its concern that he may be prevented from doing so."

Unconvinced of Effect

The resolution itself I consider unexceptionable; scientists in many countries – not only in the Soviet Union – have been used as pawns by their respective governments for a long time, and the situation of dissident intellectuals is generally intolerable.

On the other hand, one may ask what the ACM Council can or should do about such matters. I myself agreed with the ACM Constitution and Bylaws Committee which suggested that no action be taken: I perceived a substantial political component in the manner in which Turchin recently became an ACM member and in the reasons for which he was offered a visiting appointment at Columbia University.

I am also unconvinced an official position makes any difference whatever in the Soviet Union or elsewhere; when Jean Sammet [ACM president] some months ago transmitted a Council resolution to the U.S. State Department, she received no response, not even an official acknowledgment.

Finally, as we venture forth into such areas, it will become increasingly difficult to draw the line anywhere. Injustices and untenable situations occur all over the world; we might as well devote our energies full time to ferreting them out and to drafting appropriate resolutions.

In the end, all these considerations were swept aside because a substantial majority of Council convinced itself the ACM could save Turchin from disaster and the resolution was in fact compatible with the defined purposes of the association. In such circumstances any opposition is treated as callous and reactionary, for if Turchin is eventually permitted to leave the Soviet Union, the Council will argue that its actions did the trick; if on the other hand, the harassment continues, it will be said that our action was too late or not forceful enough.

Once it was agreed to put the matter to a vote, the resolution itself was adopted by a vote of 18 in favor, none opposed, with five abstentions.

I wish most sincerely that we will have done some good in this instance. But we represent neither the Executive Board of the National Academy of Sciences nor a collection of Nobel prize winners, and the government of the Soviet Union can hardly be expected to wait for the pronouncements of a few unknown American computer people before deciding on policies which they treat as entirely internal in any case.

Reader Commentary

Letters to the Editor

Misplaced Concern

In recent letters David Fuller has expressed concern over what he considers the misuse of computers in producing statistics to support pro-abortion legislation [CW, Nov. 26, Oct. 8]. Once again we are reminded of the importance of women choosing fields where they can exercise some measure of control over their lives.

If Fuller had been in charge of producing the statistics, would he have twisted them or refused to produce them? Would his standards of morality be allowed to affect the lives of all those women?

Facts are facts, and producing them isn't taking sides one way or another.

Fuller's concern seemed pretty misplaced. Where was his voice of dismay when computers were programmed to pick two male jurors for every female one?

Mary Donlon
Newtonville, Mass.

Lend an Ear

I would appreciate it if someone who has an IBM songbook would contact me at the University of California Computer Center, Santa Cruz, Calif. 95064.

I am interested in getting a copy of a couple of the songs.

D. Van Tassel
Santa Cruz, Calif.

Mystique Debunked

In regard to Jerrold Asher's article ["Programmer Mystique Can Enhance Professional Image," CW, Nov. 12], I can only say "bunk!"

If a programmer must wear a coned hat and a robe and maintain an aura of mystery to project a professional image, it is small wonder that recognition is slow in coming.

It is attitude and competence that marks the professional, not language and clothing.

Ted R. Burns
San Mateo, Calif.

Return to Normality

I have been reading *Computerworld* for about two years and could never figure out why, when I gazed at the front page, I always had the urge to run around in oblong circles and break into cold sweats for no apparent reason.

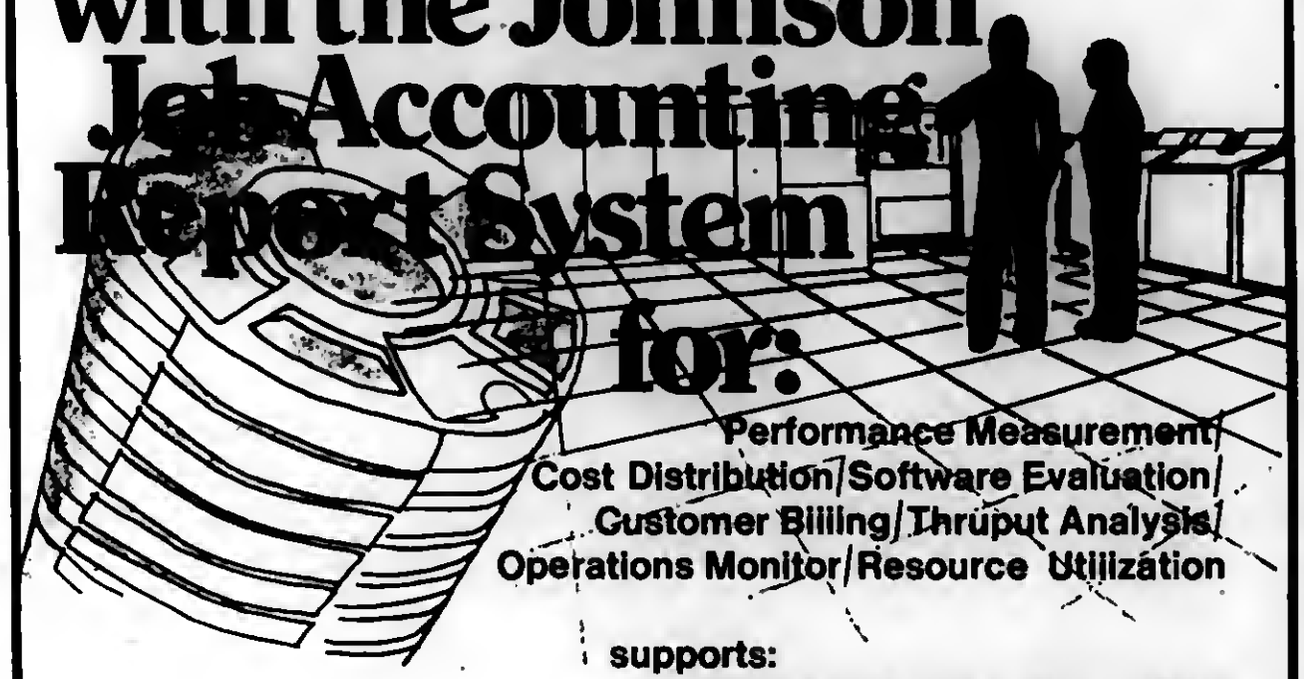
Well, this week's issue [CW, Dec. 3] caused no such bizarre behavior.

I owe this return to normality to Nathan Mark, who informed CW of the "zero" in its masthead. Thanks, Nate.

Noel Smith
Long Beach, Calif.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

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Pinpointing Problems—Part 2

SMF Poor for Channel Time, Good for Disk Space Use

By Aso Tavitian
Special to Computerworld

The channel utilization of a program is directly proportional to the amount of data transferred through the channels (for a rotational position sensing [RPS]-type device or a tape drive). While System Management Facilities (SMF) does not measure the channel time directly, it usually provides information from which the channel time can be calculated.

The number of EXCPs multiplied by the block size (both obtainable through SMF record Types fourteen and fifteen) will indicate the amount of data transferred. By using the transfer rate of the device, the channel time can be calculated.

There are conditions, however, under which the information from SMF needed to calculate the channel time is inaccurate or incomplete. An accurate calculation of the channel time is impossible in such cases.

For instance, if the program whose channel utilization is being measured uses program control interrupts (PCIs), the EXCP count from SMF is inaccurate, since SMF erroneously counts PCIs as EXCPs. Thus, the calculated channel time (based on SMF-recorded EXCPs) will be higher than the actual channel time. Some programs are known to cause four to five times more PCIs than EXCPs. The inaccuracy can therefore be substantial.

Another condition under which the channel time cannot be calculated from SMF-obtained data arises when the block size is not available in the records produced by SMF. This may occur when the program does its own I/O through EXCP or EXCPVR (e.g., a sort).

The use of the EXCP count as an indicator of channel time when the block size is not available can be quite misleading. For instance, 10 EXCPs of 13,000 bytes block size will use 1.63 times more channel time than 20 EXCPs of 4,000 bytes block size (10 times 13,000 divided by 20 times 4,000).

$$\left(13\ \frac{\text{kbyte}}{\text{track}}\right)\left(19\ \frac{\text{track}}{\text{cyl}}\right)(400\ \text{cyl})\ (60\ \text{min}) = 5.9 \times 10^6\ \text{kbyte-min.}$$

The use of an entire 3330 pack for one hour is determined by this equation.

The device time represents the amount of time a program keeps busy the devices assigned to it. Tape drives assigned to a particular step cannot be used by other tasks until completion of the step (except in MVS versions of OS/VS2).

Thus, the device-husy time for a tape drive is equal to the elapsed time of the step. Since SMF provides the step elapsed time, determination of the device-busy time for a tape drive can be done accurately.

The device time for a disk drive, on the other hand, is difficult to calculate. It consists of three components for each I/O: seeking time (i.e., disk arm movement), latency time (i.e., the time required to locate the required block of data once the disk arm has located the appropirate track) and data transfer time.

As discussed above, the data transfer time, which is the same as the channel time, can be calculated most of the time. The latency time averages to half a revolution time (8.3 msecs for a 3330) per EXCP.

However, the seek time, which can be the greater portion of the device-busy time per EXCP, cannot be determined through SMF.

SMF provides no information about the amount of disk space traversed in a given I/O operation. Thus, SMF is useless in measuring the device-busy time for disk drives.

Disk space utilization is an area in which SMF provides all necessary information to make an accurate measurement. The disk space utilization should be calculated in kbyte/min to properly weigh the difference between a program which requires significant amount of disk space, but retains it for a short period of time and a program that requires less disk space, but retains it for a long period of time (e.g., 100 cylinders for 2 min vs. 10 cylinders for 120 min).

SMF provides start/end times of a job/step, the amount of disk space allocated, as well as both the time and amount of changes in the originally allocated disk space.

Such changes can be due to secondary allocation as well as release of unneeded disk space prior to completion of the job/step.

Thus, the disk space utilization in kbyte/min can be accurately calculated even when the allocated disk space is dynamically altered during the execution of the program.

Tavitian is president of Whitlow Computer Systems, Inc. in Englewood Cliffs, N.J.

Integrated DBMS Optional on 800 Line

DETROIT – Introduced earlier this month [CW, Dec. 17], Burroughs Corp.'s 800 series includes both hardware and software enhancements over the earlier 700 systems, but the company said the 800 systems are object code-compatible with the older ones.

Following the now-typical pattern of calming users fears while exciting their interest in the new equipment, Burroughs stressed the 800 systems provide "instant maturity" of system software and "instant transfer" of user application programs, apparently without so much as a recompilation.

An array of conversion aids developed for the 700s will also work on the 800s. These include, for example, utilities to convert IBM RPG, Honeywell Series 200/2000 Cobol, Univac Series 70 Cobol or BAL to Burroughs Cobol.

Other pieces of the 800 software repetoire are carry-overs from the 700 systems, especially from the announcement of the B4790 in October 1974. The Master Control Program (MCP-VI) – which Burroughs described as a multiprogramming executive routine – is functionally the same on the 800s as on the B4790.

Working with a scheme of dynamic allocation of main memory pioneered long before the term "virtual storage" came into vogue, MCP-VI now allows up to 256 programs to be executed concurrently if system resources are available.

MCP schedules jobs for execution and maintains tables of available internal and external storage, I/O devices and files available to the system, the company said.

Capabilities of MCP-VI includes the Work Flow Management System, a scheduling and jobstream control facility. It takes into account user-defined deadlines and dependencies and produces a schedule of jobs in optimal sequence, including those which can or should be run concurrently.

A data base management system (DBMS) on the 800s, DMS II, is functionally identical to the system previously implemented on the large-scale models of the Burroughs 700 series. Unlike most data base systems, DMS II is integrated with the control program, MCP/VI, so that overhead is reduced and system throughput is sharply enhanced, Burroughs claimed.

A Cobol compiler designed to meet and exceed the 1974 American National Standards Institute specifications was also part of the 800 announcement package – and one that bears on DMS II. One of the extensions covers the data manipulation statements devised by Codasyl last spring to permit Cobol programs to work directly with data base systems.

Another feature of the compiler is a binding capability allowing users to write and debug small programs that can be compiled independently, then bound together at runtime into a large integrated system.

By working with the 1974 ANS Cobol requirements, Burroughs has also provided users with a range of "embedded" access methods not previously available, a spokesman added.

A Cobol precompiler will be provided to Burroughs 800 users wishing to work with the Forte/2 data management system. Disk-based Forte/2 generates Cobol source code that is compiled along with the user's own code to create complete application programs working with the Forte/2-managed data bases.

Burroughs Time Analysis and Billing System (Tabs VI) has been modified to report resources used by the 800 systems. Output from Tabs VI can be used for charging usage back to end-user departments or to monitor and perhaps tune the application programs so they impose less of a burden on the system.

DMS II, though integrated with MCP-VI on the 800s, is separately priced, carrying a one-time charge of $11,700 or monthly rental of $1,073. The Cobol '74 compiler is available for $50/mo, while Tabs VI costs $35/mo, Burroughs said.

'Production Fortran' on GE Net

ROCKVILLE, Md. – Processing cost savings of up to 30% over Fortran IV for interactive production applications were the design goals of the Production Fortran (PFN) system now installed under Mark III service on General Electric's (GE) remote-computing network.

GE's previously available FIV is upward-compatihle with PFN which, the company said, is "ideal" for use on proven, repetitively used programs currently running in core image or object code.

Although it employs the samc syntax as Fortran IV, compiler features that are unneeded with a stabilized program.

GE does not recommend that all FIV programs be switched to PFN. Those being used for development and immediate problem-solving situations should remain in FIV when line numher references in error messages, warning messages and subscript checks are valuable assets, the company said.

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LCP Avoids 'Structured' Terminology, Describes Problems in Terms of Data

By Peter Neely
Special to Computerworld

Within the DP community in the U.S., certain terms such as structured programming, structured design and top-down design have become the words of art which, either singly or jointly, are used to denote a "new approach" to programming.

These words do not appear in the book *Logical Construction of Programs* (LCP), yet this is the best and most readily comprehensible book on the "new approach" I have yet seen.

Concepts and Techniques

The words do not appear because the method, LCP, was independently invented by Jean-Dominique Warnier, an engineer with Honeywell Bull in France.

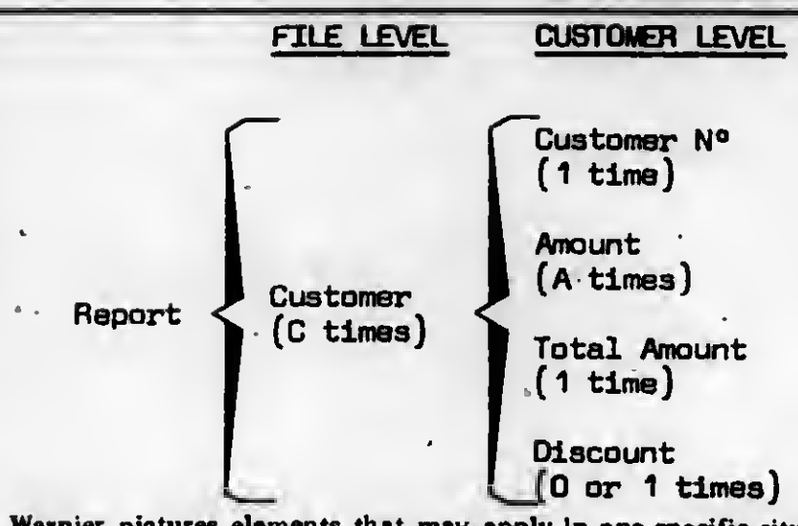
As an engineer intimately knowledgeable with the logic of switching circuits, he brought that same logic to bear on the DP problem.

The key to bringing logic to bear on the DP problem is to totally describe the problem in terms of sets of data to be processed. Then simple set decomposition and Boolean algebra (of a set and its subsets) can be brought to bear on the solution of the problem.

There is no need to introduce programming linguistics or even to specify the programming language to be used in the coding of the problem.

The sets that are required are:

- Desired output (e.g., lines of print in a report, paychecks, etc.)
- Required input (as required for the computation of the output).
- Elementary functions that are required to convert input into output (e.g., how to compute a deduction). Since sets are unordered, it is also necessary to specify the order of occurrence of the sets and their elements.



Warnier pictures elements that may apply in one specific situation but not in another with a "1 or 0" occurrence count, as with the discount in this diagram.

For a given problem, either the input or the output may be the prime determiner of structure. The disctinction between input and output is not made in the remainder of this review.

Also the input described is only that required to produce the output and does not refer to the total data base.

Also, the elementary functions involve only direct unconditional transformations (decisions are made in the program logic to determine the set that the current datum belongs to).

Given that all processing is to be described in terms of sets and subsets, the three constructs of structured programming are directly obtainable.

- Succession (impose order on unordered sets).
- Alternation (select a set or its complement).
- Repetition (to process all members of a set).

However, Warnier explicitly mentioned only the last two constructs. I prefer the term "selection" to "alternation," but that is my personal bias.

No other constructs are required. It may even be that invention of other constructs, which may obscure the simple logic inherent in the DP problem, is an error (proponents of the DO-CASE statement, please mull that over).

Overall Procedure

The overall procedure, then, is to fit a hierarchically organized description, in terms of subsets, to the data at hand. Consider the whole set of data as a single entity at the highest level of abstraction.

Subdivide that into subsets, each of which can be considered a single entity at the next level of abstraction.

Repeat this process for each of the subsets and continue the decomposition until the individual data elements are reached. To show this process, use set expansion diagrams.

Frequency of occurrence is generally indicated by 0, 1 or a symbol designating its repetition court.

For example, a report in which some customers receive a discount might be diagrammed as in the accompanying chart, reproduced from the book.

The book should be studied with care. Put your coding sheets away and review Boolean algebra. Substantial effort will be required to put the ideas into practice.

Confirmation of Correctness

It is expected that correctness of decompositions will be confirmed. That is, whenever one is faced with a complicated decomposition (complex alternation), one should draw the corresponding truth table.

Then one should engage in two methods of simplification of the decision rules. The author suggests simplification by Boolean algebra and confirmation by use of Karnaugh maps.

Concerned With Efficiency

Also the author is concerned with efficiency. Suppose that two (or more) equivalent decompositions of the data exist. First, the fact of actual equivalence can be demonstrated by use of Boolean algebra (as opposed to reliance on programming linguistic constructs).

Then the efficiency of the two decompositions can be compared in terms of the repetition counts in the hierarchical structure. One can even examine the value of putting common tasks into a subroutine. Thus the DP task can be instrumented before a line of code is written.

For each problem presented, the set expansion diagram for the data is given first (if necessary, both for input and output), followed by a corresponding diagram for the program structure and then by a well structured flowchart.

One must at times be forgiving of the translation; it is very literal, and at times the English target word may be unusual (e.g., emolument).

Unfortunately there is no index.

Neely is a research associate at the University of Kansas Computation Center in Lawrence, Kan.

They're dedicated, but are they loyal, trustworthy and efficient?

A review of "Dedicated Systems" in our January 26th Supplement.

Many users - especially small and first-time users - face a serious dilemma in this age of escalating technology and escalating prices. They need computing power tailored to their needs to solve specific problems, but they don't have the resources or the staff necessary to develop a system of their own. Systems houses have been playing a significant role in helping users get around this hurdle, because they offer users the hardware, software and systems support they need in one readily available package. The customized configurations provided by the systems houses offer users a maximum amount of computing power with a minimum requirement for professional staff to operate and maintain the system.

In this special supplement we'll be taking an indepth look at systems houses and the minicomputer-based turnkey systems they provide. And we'll be answering some very important questions like these: Who are these systems houses, and what do their services cost? What kinds of problems can they solve, and how do their solutions compare to those offered by the mainframe vendors? We'll review several case histories for specific applications, including tutorials on ways minis can be programmed to solve specific problems.

If you're involved with dedicated systems at your installation, or if you will be in the near future, then you should be reading this special supplement in the January 26th issue of *Computerworld*. And if you're a developer and marketer of turnkey systems, then you should advertise them here. Ad closing is January 9. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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For Low-Volume Application

User Adds Satellite Link Without Reconfiguring Net

By Ronald A. Frank
Of the CW Staff

STAMFORD, Conn. – The addition of a satellite link does not have to trigger the reconfiguration of a data communications network, even though many users assume the propagation delay associated with a satellite requires a full-duplex line-handling procedures with compatible protocols.

Some low-volume data communications applications can be run on satellite links without being seriously affected by transmission propagation delays. That is the experience of Robert Stoutenburgh, who is in charge of telecommunications systems administration at Combustion Engineering, Inc. (CE).

When Stoutenburgh received a requirement to connect the office of a CE subsidiary, CE Lummus, in Houston, Texas, with a Univac 1108 in London, he decided to utilize a satellite circuit for the U.S. portion of the route.

The 1108 was also being utilized by the Lummus Netherlands office in The Hague, and both the Texas and Dutch offices were working together on a development project.

The Houston office has a Harris Cope 1200 terminal which emulates a Control Data Corp. User 200 terminal. Harris provided this capability because the emulation program allows the Cope 1200 to communicate with the 1108 CPU in a protocol similar to an IBM Hasp multileaving discipline, Stoutenburgh said.

Data is being transmitted at 2,400 bit/sec between the Texas office and a CE office in Bloomfield, N.J. The American Satellite Corp. circuit ends at the firm's terminal in Dallas and a 4 kHz private line completes the link between Dallas and Houston. The Texas portion is provided by CPI Communications, an intrastate specialized carrier.

At 2,400 bit/sec it takes 2.5 sec to transmit a block of data, Stoutenburgh estimated. This includes .5 sec for the line acknowledgment and amounts to a 20% degradation over private land lines, he said.

But the slow transfer rate was not important because the Texas office was only transmitting about one hour of data each day. If the degradation was significant to the application, the transmission speed could have heen upgraded to 4,800 bit/sec, he said.

For low-volume applications it was not necessary to switch from a half-duplex to a full-duplex protocol in spite of the delay, Stoutenburgh said. Also, a protocol change would have meant new terminal equipment.

Speed Worth Savings

While the line may be somewhat slower, the user said the cost savings is worth it. The American Satellite link costs about $1,000/mo compared with an estimated $1,700/mo that would be charged for a land-based private line, he said.

At the New Jersey office, the 2,400 bit/sec signal from Texas is combined with a similar-speed local circuit by a Codex multiplexer. The resulting 4,800 bit/sec data stream transmits the information to The Hague, where it is demultiplexed by another Codex unit. From there the data is sent at 2,400 bit/sec to the Univac 1108 in London.

The New Jersey office utilizes the local 2,400 hit/sec line to attach two Cope 1200 terminals into the network using Codex limited-distance line drivers.

Western Union International provides the transatlantic carrier facilities, and the network also includes a Cope 45 concentrator in The Hague.

The communications net is part of a software development project related to energy. Programmers at the Cope 1200 in Texas and at a Data 100 Model 78 terminal in The Hague are able to compare software steps over the communications facilities. The software is being jointly developed from both sites on the 1108 in London.

The satellite link has been in operation on the alternate voice/data network since last August without major problems, Stoutenburgh said.

ITTDTS Planning Packet-Switched Net

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – ITT Domestic Transmission Systems, Inc. (ITTDTS) has applied to the Federal Communications Commission (FCC) for authorization to operate a data communications network that would allow noncompatible terminals to transmit data to each other or to noncompatible CPUs.

ITTDTS has proposed to establish and operate an interstate packet-switched digital data network providing store-and-forward services among others. The digital data communications net would integrate both packet-switching and store-and-forward techniques, the company told the FCC.

Com-Pak Network

To be called the Com-Pak network, the service will be composed of communications processors, CPU peripherals and interface processors linked by high-speed communications channels.

The nationwide network, scheduled to go into operation in June 1977 with 13 cities, will use carrier facilities provided by AT&T, Western Union, SP Communications, and the Data Transmission Co. In a later expansion phase, Microwave Communications, Inc. lines will be added.

Initially the network will utilize 9,600 bit/sec lines and 4 kHz voice grade lines, but 56K bit/sec circuits will later be added.

Com-Pak will at first offer transmission services between any types of facsimile devices. In addition, it will allow communications between data terminals, CRTs and teleprinters and these will also be able to communicate with facsimile devices.

Each category of service will be provided on either a priority or store-and-forward basis. An additional service is being developed to allow communications between mainframes and between mainframes and terminals, the firm said.

A Com-Pak user will be able to access the network using either private or dial-up lines and charges for the service will consist of a monthly subscriber charge, acceptance and delivery charges, rates per message transmission and one-time installation charges.

The code, speed, protocol and modulation conversion capabilities required to allow noncompatible devices to transmit data to each other will be an integral and automatic network feature without a separate charge, the company said. Network rates will vary depending on the class of service selected by the user.

Three Levels of Service

For store-and-forward customers three levels of service will be available – priority delivery of information, which means within 15 minutes; regular delivery, which means within four hours; and overnight delivery.

Interactive customers will receive immediate, simultaneous transmission and reception of information.

The network will include 10 computer switching centers and 14 concentrator sites. Each concentrator site will be linked to one of the switching centers by analog facilities and the switching centers will be linked with each other using digital data lines.

Data and facsimile messages will be received, digitized, temporarily stored and converted to network format at the local concentrator and then forwarded in packets via the switching center to the destination.

At each center, the packet will be checked for errors. At the destination center, it will be rechecked for errors, reassembled and converted to a mode compatible for the receiving device or terminal.

Each switching center will consist of multiple processors configured with modular software to "permit a distribution of the systems' processing and switching functions." The center will consist of concentrators for interfacing to local subscribers.

In addition, each center will have disk and magnetic tape storage, card readers, printers "and specialized hardware."

All messages will be divided into packets of varying length up to 8,192 bits. These packets will be transmitted in one of two ways: transmission will utilize store-and-forward techniques that allow load balancing and the ability to assign priority message levels, or a virtual or logical circuit will be provided between the origin and destination.

FCC Asked to Rethink DAA Ruling

WASHINGTON, D.C. – AT&T has told the Federal Communications Commission (FCC) it should reconsider its decision to eliminate the Data Access Arrangement (DAA).

In a petition filed with the FCC, the phone company said a registration/certification program of the type adopted by the commission "cannot protect the network."

The registration rules adopted "are in many instances technically unsound and deficient in scope and need to be extensively revised [in order] to be workable."

Some of the universal interface criteria "plainly cannot be applied to certain types of equipment" and the rules must be modified accordingly, Bell said.

The requirement that phone company-supplied equipment be registered is not in the public interest and serves no legitimate purpose, Bell said.

In addition to AT&T, General Telephone & Electronics and Continental Telephone also asked for reconsideration of the registration ruling.

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NCR Enhances Model 279

DAYTON, Ohio – NCR Corp. has developed an enhanced version of its Model 279 financial teller terminal with additional totals and communication modes for use in commercial banks, savings and loan associations, savings banks and credit unions.

The most recent version of the Model 279 terminal can be used in a free-standing mode and is upgradable to an on-line system, according to NCR.

In addition to capabilities available with other Model 279s, this version offers seven function totals for both the primary and the relief teller, seven batch totals which are shared by both tellers and three-digit activity counters for each batch total.

Three optional communications modes of operation are also available, including the ability to communicate to a central computer through the NCR 751 digital concentrator, through an integrated modem or through an external modem.

In an on-line operation, the terminal can receive unsolicited messages from the central processor, NCR said.

Purchase price of the off-line version of the terminal is $2,775; rental is $93/mo and will be available in the first quarter, NCR said.

The off-line teller terminal can be upgraded in the field to include on-line capabilities at costs ranging from $225 to $500, depending on which communications capabilities are desired. All communications features for the terminal are field-installed or activated, NCR said.

Model 279 terminals now in use can be upgraded in the field to match the enhanced model's performance at costs starting at $500, depending on the results desired, the company said here in Dayton, 45479.

Sycor Ecma-Compatible Devices Prepare Data for Small Systems

ANN ARBOR, Mich. – Sycor, Inc. has introduced two European Computer Manufacturers Association (Ecma)-compatible intelligent data entry terminals designed primarily to prepare data for small business computers, the company said.

The models 310 and 320 are said to have been approved for use with Honeywell, Inc.'s Series 62 and Sweda International's 1300 small business systems.

Both terminals are equipped with a CRT, typewriter-like keyboard, ECMA-compatible cassette recorder and microprocessor.

The 310 and 320 are also equipped with 8K bytes of read-only memory (ROM) and programs that control all terminal functions including format programs for specific data entry applications, arithmetic and checking operations, the collection of data on cassettes and communications.

The Model 310 includes one cassette recorder and may be equipped with an optional 3K bytes of random-access memory (RAM). This optional memory enhances the terminal's built-in error detection and arithmetic capabilities via the company's proprietary Terminal Application Language (TAL) for range checking, table look-up, multiply and conditional data entry, Sycor said.

Terminal Transactions

The Model 310 can communicate using both binary synchronous communications at 1,200 bit/sec to 4,800 bit/sec rates and asynchronous procedures at 110 bit/sec to 1,200 bit/sec.

The Model 320 includes a second cassette recorder and provides input of stored format programs, tape pooling, selective copying of data from one cassette to another, storage of information for file search and retrieval and automatic transmission and reception of data, the company said.

The Model 320 communicates using binary synchronous procedures, it added.

Phase-Encoded Recording

The terminals' recorders use a phase-encoded recording technique and may write on both sides of the tape cassette, increasing the storage capacity from 240K char./tape to 480K char./tape, the company said.

The models 310 and 320 only provide interfaces for cassette recorders and communications, it added.

The Model 310 is priced at $204/mo on a one-year lease and $175/mo on a three-year lease; both lease prices include maintenance. The purchase price of the unit is $6,380, Sycor said.

With an additional 3K bytes of RAM, the monthly lease is $232 on a one-year lease and $199 on a three-year lease. The purchase price of the Model 310 with RAM is $7,180.

The Model 320 is priced at $239/mo on a one-year lease and $205/mo on a three-year lease, including maintenance.

First deliveries of both models are expected in January, the company said from 100 Phoenix Drive, 48104.

Clustered CRTs Share Same Teleray Printer

MINNEAPOLIS – Research, Inc. is offering its Teleray CRT terminals in clusters of two to six terminals with a common printer.

Individual terminal operators can select hard copy by pressing a button on the CRT keyboard. An indicator light on the terminal shows the printer is being operated by that particular CRT; other terminals in the cluster are not disturbed, the vendor said.

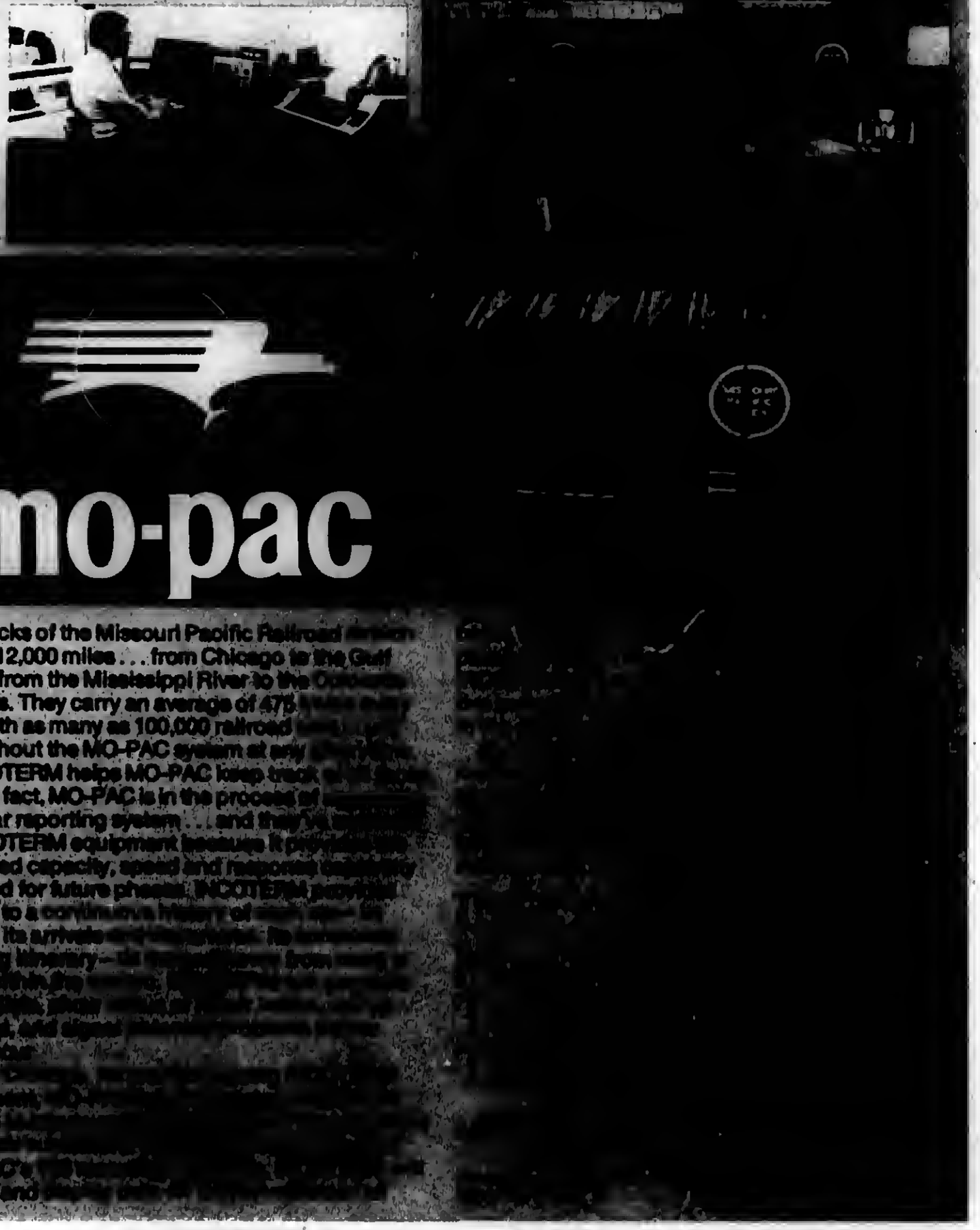
The Teleray printer has a 5 by 7 dot matrix and operates at either 110- or 300 bit/sec. It adjusts speed automatically to match the terminal in the cluster that is "asking" for hard copy, according to the company.

Standard options available to the clustered Telerays include composite video and space over data. The cluster comes with "daisy chain" cables for 12-ft separation between terminals and between printer and first terminal.

A typical five-terminal clustered system with printer costs "under $9,000," a spokesman said, with delivery in 30 days. Research can be reached at Box 24064, 55424.

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SYSTEMS&PERIPHERALS

Bits & Pieces

NMA's Annual Conference Set for April in Chicago

CHICAGO – The National Microfilm Association (NMA) will hold its 25th annual conference and exposition here April 27-30 at McCormick Place.

The event is expected to have over 100 exhibits and 166 speakers, the association said.

The conference will be preceded by two fundamental seminars for beginners: "Basic Data Processing" and "Fundamentals of Micrographics." All conference sessions will be designated for beginner, intermediate or advanced audiences.

The conference itself will open on Tuesday with a session on "Common Interests and Applications."

The following day will offer "Technology Reviews."

"Implementation" sessions will be offered on Thursday, and the conference will end on Friday with "The Future of Micrographics."

Registration information is available from the NMA Conference Department, 8728 Colesville Road, Silver Spring, Md. 20910.

Fabri-Tek Hikes Storage Unit Prices

MINNEAPOLIS – Fabri-Tek, Inc. has announced a 10% hike in the price of its Bulk Core Storage System, which is intended to replace the rotating drum storage units in Honeywell's GE/PAC 4000 process-control computer series.

"Even with the price increase, the system is less expensive and does not require the expensive periodic refurbishment associated with the drum storage it replaces," a Fabri-Tek spokesman said.

A typical 256K (word) Bulk Core Storage System sells for about $60,000 from the firm at 5901 S. County Road 18, 55436.

GKI Cuts Tape Cleaner Cost

ROCKVILLE, Md. – General Kinetics Inc. (GKI) has lowered the price of its CE-70 magnetic tape cleaner/evaluator and said users can now order versions with fewer features for further saving.

The CE-70 can clean an 800-, 1,600- or 6,250 bit/in. tape and then write along the length of the tape. The CE/70 can then read back the data on the tape to check for errors.

About 30 selections and options are available, GKI said.

The price cut trims about $250 from the previous $7,000 to $9,500 cost of a CE-70, a spokesman said. The less fully equipped models can reduce these prices by up to $600 more, he added.

GKI is at 12300 Parklawn Drive, 20852

With Self-Threading Cartridges

User Reduces Tape-Mounting Time Lag

Special to Computerworld

SAN FRANCISCO – Since switching from an automated tape-retrieval system to a manual tape-storage system, Pacific Gas and Electric (PG&E) has speeded tape mounting and saved computer runtime.

That change, combined with hardware consolidation and a recent move to third-party leasing contracts, has helped cut PG&E's DP costs by 4% over the past 18 months – even though the company's computer use has climbed 17% in the same period, a spokesman said.

The manual system replaced a Supreme Equipment & System's Corp. Conservatrieve automated tape library that the utility installed in 1970. The Conservatrieve, with a built-in minicomputer, fed tape canisters to the tape librarian at the touch of a button.

While the automated device did not load the tapes onto drives, it did save the librarian a lot of walking and provided a high level of security and control, the spokesman said.

But by the spring of this year, the automated device was wearing out and reliability lapses were presenting a problem.



Pressing on a cartridge spring-activates it into position for removal from its storage rack.

At that point, PG&E decided the Easy-load tape cartridge concept had proven itself in commercial use and would suit its needs better than another automated system.

The Tab Products Co. tape storage system PG&E installed suspends color-coded, self-loading tape cartridges from horizontal racks.

"The color coding all but eliminates misfiled tapes," the spokesman said. "Misplaced volumes stick out like a sore thumb."

The tape-handling facility includes EL II tape cartridges compatible with PG&E's self-loading IBM 3420 models 7 and 8 tape drives, the color-coded labeling system and a tape cartridge storage filing system.

"The operator loads the tape on the drive, cartridge and all, and the tape drive automatically opens the cartridge and threads the tape without manual intervention," the PG&E spokesman explained.

The time per reel change is 10 sec less than the previous approach. Based on the utility's 2,000-reel changes a day, the direct-loading cartridges reduce tape-mounting time by more than five hours daily.

Each self-loading cartridge has its own tape identification number affixed to the circumference of the cartridge; the identification is thus fully visible when vertically suspended in the racks.

PG&E personnel need not queue formerly used mechanical pickers at times of heavy activity, and librarians also don't have to remove tapes from canisters to engage or disengage write-enable rings or external labels when required.

Behind-counter access to the library is still controlled. Programmers are required to plan ahead since priority and sequence of jobs determine picking order.

A computerized tape-management system also cross-references tape identification numbers with job name and identifies purge dates.

Device Reads Two Card Types

BLUE BELL, Pa. – A version of the Univac 0716 card reader that can handle both 96- and 80-column cards has been introduced for use with Univac's 90/30 computer system.

The Univac 0716 previously handled only 80-column cards. The dual-reading version allows IBM System/3 users to upgrade to the 90/30 with the option of retaining 96-column cards and their prior data entry equipment, Univac said.

Operators can quickly switch the dual-reading version from 96- to 80-column modes, Univac said.

The 80/96 column reader is available for the 90/30 in 600 card/min or 1,000 card/min versions. It can be upgraded from the lower to the higher speed.

The dual-mode version 0716 provides a single input hopper with a capacity of 2,400 80-column or 2,000 96-column cards. Each of two output stackers handles up to 2,000 cards. An optional feature allows for handling 51- and 66-column short cards.

Prices for one-year rentals are $421/mo plus $102 maintenance for the 600 card/min reader and $490/mo plus $146 maintenance for the 1,000 card/min model. Lower prices are available with longer term contracts.

Purchase prices are $20,208 for the lower speed and $23,520 for the higher speed version.

Univac said the dual-mode 0716 will be available early in the second quarter.

Telex to Offer 3350-Type System

TULSA, Okla. – Telex Computer Products, Inc. will offer a high-capacity disk subsystem compatible with IBM's recently announced 3350 disk subsystem, the company said.

The drives will be built by Univac's Information Storage Systems.

Called the Telex 6330-12, the subsystem will provide the same 317M-byte storage capacity as the IBM 3350, but will also offer a movable pack as well as attachment to certain 360 systems and nonvirtual 370s..

Telex's current 6330-10 and 6330-11 100M-byte and 200M-byte subsystems can be field-upgraded to the 317M-byte 6330-12 system.

Telex said it will offer a variety of lease plans to facilitate this upgrade flexibility and assure "major savings" vs. the equivalent IBM products.

Deliveries of the 6330-12 will begin in early 1977 from the firm at 41st and Sheridan Road, 74101.

With our Video 100 you don't need a ton of paper to debug a program.



Debugging a program with hard copy can be tough. You can't get to the bottom of the problem 'til you get to the bottom of the heap.

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Mini Bits

Plessey Has 16-Bit Micro With 350 Nsec Cycle Time

SANTA ANA, Calif. – A 16-bit microcomputer with a cycle time of 350 nsec and 82 instructions, including multiply and divide, is available from Plessey Microsystems.

The Plessey Miproc 16 is configured for parallel fetch and execution with two separate program memory and data memory architecture so most instructions take a single cycle. Conditional branches take 700 nsec and multiply/divide times are 5.6- and 11.2 μsec.

The micro is supported by a prototype development system and a Fortran IV cross-assembler and simulator for use on the Tymshare and GE Mark III networks.

The system, which includes chassis, CPU, front-panel logic, 1K or high-speed bipolar random-access memory, .5K read-only memory, paper tape reader and power supply, costs $5,000 and is available from the firm at 1674 McGaw Ave., 92705.

ICP-700 Configured for Accounting

DALLAS – A small business computer system for general accounting use has been introduced by International Computer Products, Inc. (ICP) here.

The ICP-700 has a base price of $12,500 and the basic system includes a CRT display and keyboard, 16K MOS memory, three cassette drives or two floppy disk drives and a console.

The system is also offered with a variety of line printers, fixed-disk drives, up to 64K memory, typewriters and communications devices, the firm said.

The system comes with four basic general accounting software packages, including payroll, inventory, order entry and general ledger, and there is a library of application software, according to the firm at 2925 Merrell Road, 75229.

Disk Controller Fits Novas

ANAHEIM, Calif. – A single-board disk controller that allows both multidisk, single-platter drives and cartridge drives to be used with Data General Nova and Data General-emulating computers is available from Western Peripherals, Inc.

The unit, called the DC-220, controls as many as four single-platter cartridge drives, two dual-platter drives, two single-platter drives with 406 track/surface or a single dual-platter drive with 406 track/surface.

It can also control two 10-disk platter drives, Western Peripherals said.

The DC-220 costs $2,500 from the firm at 2893 E. La Palma Ave., 92806.

In Accounting Application

User Finds Self-Education Pays Dividends

By Mal Stiefel
Special to Computerworld

SAN FRANCISCO – Minicomputer users often lack the expertise needed to get their special applications running and must rely on self-education and a software designer who knows his business.

In one small shop here, an accountant uses a disk-oriented Varian Data Systems 620/E for general ledger, payroll billing and statistical analysis.

The user began searching for a replacement for his Monroe magnetic card bookkeeping system in 1971. He was looking, first of all, for an approach to selecting a computer system.

He rejected the alternative of a service bureau because he didn't want sensitive client data to leave the office.

When the University of California offered a short "Mini vs. Maxi" extension course, with lecturers from hardware manufacturers and from industry, the accountant attended, gaining enough insight to develop a bid package that embodied his requirements.

Several manufacturers were invited to submit proposals, but only Xerox Corp.'s Data Systems Division (DSD) and Varian responded. The Varian entry won out at $25,000, about "half the price" of the DDS unit.

The system, with 16K bytes of core, a card reader, line printer and two small disk drives, was installed in 1972.

More core, bigger disk drives and a tape drive were added as the workload grew, bringing total hardware cost to $100,000. Varian handled maintenance from the beginning and current maintenance costs are $1,054/mo.

Searched for Help

When the system was first purchased, the user searched for help to develop the initial general ledger and payroll packages.

Varian had no business-oriented application programs then, and it couldn't recommend any software supplier in the area.

On his own, the user found a knowledgeable programmer/analyst in a local software house to design and implement the programs.

The software house failed subsequently, so the user hired the programmer as a consultant to continue the work. The programmer had access to the accountant's system for software development and a license to market the completed packages independently.

Programming began in RPG-II, but they quickly switched to Fortran and machine language after finding RPG-II too restrictive. The programmer later put together an Indexed Sequential Access Method route, married to Varian's Vortex operating system and a sort/merge utility.

The programmer continues to maintain the utilities and the application programs, supplying upgrades without charge. Thus far, the user estimates that all software has cost about $30,000 over the life of the system.

Today, the system handles general ledger, payroll, billing (of the accountant's clients) and a sophisticated statistical package developed for a law firm.

The latter provides the lawyers with a complete analysis of the number of hours of each class of lahor (legal, secretarial, etc.) worked for each client every month as an input to their billing proccdure and an analysis of legal staff and support staff productivity each month.

Final bills are figured by hand, because the computer doesn't carry all of the exceptions and special arrangements made for each client.

The machine is used five days a week, 12 hours a day. There's a full-time operator, a full-time keypuncher and two control clerks who run the computer in the morning before the operator arrives.

The user, who asked not to be identified, said getting the programs into operation took longer than he anticipated, but he said he's happy with the software and hardware.

Additional developments are being studied, including a text editing package which will require CRT terminals, and packages oriented toward specific groups of clients such as trustees of estates and foundations.

Mod Five Upwardly Compatible With DCC D-116 Minicomputer

FAIRFIELD, N.J. – The Digital Computer Controls, Inc. (DCC) Mod Five is said to be upwardly compatible with the firm's D-116 minicomputer.

The firm has filed an appeal staying a Delaware Chancery Court injunction that would have barred the company from manufacturing and marketing the D-116 [CW, Dec. 10].

"The Mod Five machine was in the works for some time," a DCC spokesman said. "We find it appropriate to release the machine at this time. We have no intention of dropping the D-116 from our line."

Existing controllers and software developed for the D-116 and D-116H will also run on the Mod Five, the company said.

Mod Five features include an extended single-word instruction set, overlapped instruction fetch concurrent with the execution of instructions, triple stack processing and a vectored interrupt system, the firm added.

Operating systems include RTX, a real-time executive; MSOS, a mass storage operating system for real-time and batch operations; and EOS, a business and scientific operating system.

The system is available with a 4- to 17-slot chassis and can have 800-, 1,000- or 1,200 nsec cycle times. All peripherals for the current D-116 system are available for the Mod Five.

Prices for the Mod Five are equivalent to D-116 prices, a spokesman said. They range from $2,975 for a CPU with 4K 16-bit words and a 4-slot chassis to $29,270 for a CPU with 128K words of memory and a 17-slot chassis.

IBM Trying 5100 Purchase Plan

ATLANTA – A three- to six-month lease/purchase test plan for the IBM 5100 has been announced by the corporation's General Systems Division here.

The plan allows the potential customer to try the 5100 for 90 days before purchasing the unit. An additional 90-day extension is available.

The customer has the option to buy any time during the trial period, with up to 70% of the lease price applied to the purchase price, according to IBM. The contract may he canceled only after the full three-month period, a spokesman said.

The plan includes IBM maintenance coverage.

The purchase test plan price for three months for an IBM 5100 with Basic and 16K bytes of main storage is $1,350, IBM said. The purchase price for that system is $8,975.

Test plan price for the 5100 with both APL and Basic and 64K bytes main storage is $3,000 for three months. The system costs $19,975 to buy.

Also announced was a serial I/O adapter that permits the attachment of CRTs, paper tape units, plotters, card reader/punches and printers to the 5100. The adapter costs $700 or $105/mo under the three-month plan.

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Better Use of Capital Possible

RJE Helps Firm Keep Vigil Over Catalog Inventory

NASHVILLE, Tenn. – When a company runs 30 showrooms in 11 states scattered in the Southeast and Midwest, controlling inventory requires constant vigilance. This is where a mini-based remote job entry (RJE) system enters the picture at Service Merchandise Co., a large catalog showroom.

About three years after it was founded, in 1962, a service bureau data processing system was set up.

Over the years, DP has constantly been upgraded, both in the home office and in the field.

The operation, under David Greenberg, operating vice-president for DP, contains a Honeywell 2050 with 192K core storage, 900M-character on-line disk storage, four tape drives, two printers, two readers and a front-end processor with both in-house inquiry and communications with the showrooms by means of a 2780 emulator package.

Early this year, the company installed the Micos minicomputer system developed by Mini-Computer Systems, Inc., which provides in-house time-sharing and two-way RJE.

The Micos configuration consists of a Data General Corp. Nova 2/10 with 65K-byte capacity, a 10M-byte disk drive, three 8-line multiplexers for on-line showroom terminals and printers and a bisynchronous communications controller.

The Micos base is the complete Service Merchandise catalog on file in the disk, currently totaling around 27,000 items.

Data includes all inventory quantities, stock movement history, pricing and pointers to alternative products if the product desired by the customer is out of stock. Each item is uniquely accessible by catalog number or by its six-digit point-of-sale number.

Basic Function

The basic function of Micos is to accept customer orders from the cashier-operated CRT station and to determine, through direct inquiry, whether the item is in stock.

Currently there are 12 CRTs and three printers in each of two showrooms – one Nashville outlet serving as a prototype close to home and one in Charlotte, N.C.

Once a catalog number and quantity are entered, the price is determined, the location of the items is reported, stock level is checked and decremented and the information is returned to the CRT.

When the order is totaled, a release is printed in the warehouse to have the merchandise picked from the shelf and sent by conveyor belt to a customer pick-up area.

If the item is out of stock, the customer is offered the model on display or can select from a list of alternatives provided on the spot.

Nightly Report

During the night, the Honeywell system in the home office receives a detailed report of the day's activity, which is processed for the combined inventory report that is run every night.

On designated days, the system will call back, sending to the Micos system file all additions of goods, catalog number changes and price changes.

Service Merchandise intends to install Micos systems in all its showrooms. Greenberg sees each such location eventually functioning as a self-contained operation, handling not only the current duties, but others such as vendor debts, bad checks, mailing lists, etc.

There is also the distinct possibility that the Micos system will take over the cash register function some day, he said.

Intel Has Add-On For 7/16 Minis

SUNNYVALE, Calif. – An add-on semiconductor memory system for the Interdata Model 7/16 Basic minicomputer has been introduced by Intel Memory Systems.

The In-4716 system stores up to 16K 17-bit words on a single card and up to 32K words on two cards.

The system can be used in the same minis as core memory modules, Intel said.

The In-4716 has a 300 nsec access time and a 1 μsec cycle time.

The basic single-card system is available in three versions storing 8K, 12K and 16K words. Each card is a complete system, with all control, refresh and interface logic, according to the company.

At 16K, the In-4716 costs $1,985 and is available from the firm at 1302 N. Mathilda Ave., 94086.

DATA DIMENSIONS INTRODUCES THE RENTABLE DECwriter II...WITH MAINTENANCE BY DEC.

As little as $65 a month, including maintenance by DEC. Many other options, too. Even a $45 monthly, 5-year lease/purchase plan. And an unbeatable cash purchase plan.

Now you can have the printer terminal that's three times faster than teletype for little more than the cost of teletype.

Data Dimensions, Inc. makes this possible through a new purchase/maintenance agreement with Digital Equipment Corporation. The agreement enables us to provide DECwriter II data terminals to computer users across the nation through a variety of rent-or-buy options. Take your choice:

1. **THE DDI RENTAL PLAN:** options range from $95 a month for a single, standard LA 36 unit on a one-year lease to as low as $65 a month. And full on-site maintenance is included in your monthly rental!
2. **THE DDI LEASE/PURCHASE PLAN:** rates range from $70 a month over a 2-year period down to $45 a month. And at the end of the lease, you can own the machine for one dollar! By agreement, maintenance is available from DEC at standard rates.
3. **THE DDI PURCHASE PLAN:** you can buy a single unit from Data Dimensions for $1695, or buy in quantity and gain substantial discounts.

This program is one example of why you can count on DDI to bring you the best – in performance, maintenance and price. We are one of the largest suppliers of data communications equipment in the nation. We have the buying power to seek out the best buys for you. And because we carry a complete assortment of terminals and other communications equipment, we have no axe to grind – we provide the equipment that best serves your needs and budget.

We might or might not recommend a DECwriter II for your operation. If we don't, it'll be because we can give you even better cost efficiency another way. Challenge us. For more information, write Data Dimensions, Inc., 51 Weaver Street, Greenwich, Conn. 06830. Or better yet, call Bob Loonin at (203) 661-1700.

Data Dimensions, Inc.

THE RENTABLE!



HOW MANY SALES LEADS DID THIS AD PULL?

Guess right and you win a rent-free DDI 265 portable terminal for three months!

Here are 3 clues:

1. This ad appeared in Computerworld. Rudy Menna, President, Data Dimensions' Equipment Division, thought the ad might pull 30 replies. Total.
2. The first day it generated 36.
3. Three months later, Rudy was still getting inquiries.

Some more clues:

If you know the terminal market, you know Data Dimensions, Inc. only handles winners. More than a traditional leasing company, DDI performs comprehensive evaluations of manufacturers' products to insure that they'll meet your needs. DDI's product line offers you a complete remote communications capability.

Next clue: DDI wanted to reach every possible interested person with news of their new product, so they chose the newspaper for the entire computer community, Computerworld.

Response was immediate. Inquiries came from computer professionals in every type of business — including universities, banks, hospitals, government, insurance companies, and manufacturers of food, drugs and cars. Resulting sales were excellent.

Was it just a lucky first shot? Not at all. DDI repeated the ad, and got even better results.

Guess how many leads the first ad produced, and DDI will install the industry's most reliable portable terminal — yours to enjoy for three months, with NCR service included — all at no cost to you!

COMPUTERWORLD

Roy Einreinhofer, National Sales Manager
Computerworld
797 Washington St., Newton, Mass. 02160

Sure I'd like to have the portable terminal rent-free for three months.
My guess is the DDI ad pulled _____ sales leads.

My name _____

Title _____

Company _____

City _____ State _____ Zip _____

COMPUTER INDUSTRY

CI Notes

Honeywell, Xerox Powwow Over Manufacturing Rights

EL SEGUNDO, Calif. – Honeywell, Inc. is negotiating for manufacturing rights to Xerox computers in addition to the sales and service agreement originally announced by the two firms [CW, Oct. 22].

This "new element" has extended current negotiations beyond the Dec. 1 completion date originally projected, but a contract is expected to be signed "before the end of the year," a Xerox spokesman said.

A source indicated Honeywell does not intend to assume operation of the Xerox manufacturing plant here but would probably want to set up its own manufacturing operation in one of its own facilities, perhaps in Phoenix.

Itel Discontinues 360 as Planned

SAN FRANCISCO – Itel Corp. has completed the discontinuance of its IBM 360 leasing activities on scheudle without any need to adjust the $30 million already charged against 1973 results.

Sycor 440 Orders Total $6.5 Million

ANN ARBOR, Mich. – Sycor, Inc. has amassed over $6.5 million in orders for its 440 clustered terminal processing system, introduced three months ago.

Most of the orders came from current Sycor customers "who wish to integrate their existing Model 340s and 350s into a common user information network," according to Paul C. LaVoie, vice-president of marketing.

CSC Forms French Link

EL SEGUNDO, Calif. – In a move to gain access to major systems development contracts with the French government, Computer Sciences Corp. (CSC) has agreed to sell a majority interest in its subsidiary, Computer Sciences International France, to a subsidiary of Thomson-Brandt.

CSC President William R. Hoover said the association with Thomson will enhance the unit's ability to address major opportunities for systems development for the French government.

SEL Nets EAI Order

FORT LAUDERDALE, Fla. – Electronic Associates, Inc. (EAI) has agreed to purchase about 100 Systems Engineering Laboratores, Inc. (SEL) 32 series computer systems over a multiyear period.

EAI's first order, valued at $1 million, specified initial deliveries during the first quarter.

The SEL equipment will be integrated into EAI's fossil fuel and nuclear power plant training simulators as well as large-scale hybrid computer systems also manufactured by EAI.

Supershorts

The Memory Systems Division of Intel Corp. has named Sorbus, Inc. and Telex Service Corp. to provide maintenance services in the U.S. and Canada for the division's line of add-on memory products for IBM 370 computers.

– – –

Shugart Associates has signed a five-year license agreement allowing Matsushita Communication Industrial Co. to manufacture and market its flexible disk drives in Japan. The agreement is subject to approval by the Japanese Ministry of International Trade and Industry.

Report on '74 Indicates

User Loyalty Remains at All-Time High

By Molly Upton
Of the CW Staff

WALTHAM, Mass. – Customer loyalty remained at an all-time high during 1974, possibly due in part both to the advanced life cycles of computer generations and to the rocky economy, according to *EDP Industry Report* (EDP/IR), a newsletter from International Data Corp.

Compared with 1973, a smaller percentage of each vendor's customer base chose to replace CPUs, and signs indicated the same held true for the absolute number, EDP/IR said.

"Such a stay-at-home trend could easily be interpreted as caution in the face of product lines passing their prime," the newsletter added.

Since the ratio of computers in single-vendor sites vs. mixed-vendor sites was higher in 1974 than in 1973, EDP/IR concluded "the mixed sites seemed to be pruning vendors."

IBM again ranked first in loyalty at single-vendor sites with the same percentage of loyal customers as last year, 94%. It also had more action in turnover of its base than other competitors, in terms of both numbers of systems and their value, the report indicated.

Burroughs was second in site loyalty, at 89%, while both Honeywell Information Systems (HIS) and NCR lost ground.

HIS dropped from 85% to 80%, while NCR went from 88% to 81%, according to the report.

Univac continued its upward trend, advancing from 61% to 70%, while the category of other vendors jumped from 37% loyal to 56%.

The overall ranking of percentage of loyalty was 90%, the same as last year, and less than the 92% that had been forecast.

For 1975, IDC forecast Burroughs' loyalty will climb to 91% in 1975, and NCR's to 85%, while Univac will jump to 85%.

However, HIS should continue to fall, to 73%, and IBM will decline to 92%.

The "other" category will climb to 60% in 1975, according to EDP/IR predictions.

Based on 773 Sites

The forecast was based on 773 sites vs. 1,098 for the previous year's forecast.

The loyalty percentage was calculated by dividing the number of customers reordering from a vendor by the sum of customers reordering from a vendor and customers lost to competitors.

The study did not include first-time users and was limited to general-purpose computers, which does not include most minicomputers.

In comparing activity at mixed- vs. single-vendor sites the survey, which examined 3,356 single-vendor sites, showed NCR led with a ratio of 10:1 single- vs. mixed-vendor sites; followed by IBM, 4:1; Burroughs and Univac closer to 2:1; and HIS at 1.3:1.

Heavily weighted by the IBM average of 4:1, the overall installed base of single-vendor sites was 3.5 times that at mixed sites, EDP/IR said.

Equipment Value at Sites

The value of equipment at single-vendor sites rose six times more than at mixed sites during 1974. NCR and Univac saw a decrease in mixed site value.

Equipment at IBM's single sites increased in value seven times more than at mixed sites, and Burroughs' and HIS' single sites increased twice as much, EDP/IR said.

"At the beginning of the year, the installed value of IBM sites to receive computers in 1974 – whether of IBM or other origin – was 22% of the entire IBM base," the report said.

Other firms had about 15% to 16%, IDC said.

Compared with 1973, 1974 was a "sluggish year" the report said, with more activity at mixed-vendor sites. The overall base, mixed- and single-vendor sites, turned over nearly 4% more in 1973, according to the study.

IBM, DOD Planning Sales Pact Some See as Move to Evade GSA

By CW Staff Writers

WASHINGTON, D.C. – IBM, which missed the filing date for inclusion under the federal Automated Data Processing (ADP) Supply Schedule, has drawn up a proposal with the Department of Defense (DOD) for equipment sales that observers fear could be an end run around the General Services Administration's (GSA) central authority over DP procurements.

The proposal is a "mirror" of the schedule IBM would have filed with the GSA had it been done on time and includes equipment for both demestic and overseas locations, a government source indicated.

Theodore Puckorius, GSA's commissioner of automated data and telecommunications services, said no contract has been approved, but he confirmed the GSA has issued a delegation of authority to the DOD that enables it to establish an "indefinite quantity contract" permitting its agencies to acquire equipment from IBM.

However, Puckorius emphasized the contract allows DOD to purchase equipment "only after all other procurement requirements, including competitive bidding, have been met."

DOD requested the contract to eliminate the need to write "potentially thousands of separate contracts with IBM," Puckorius explained.

The GSA has asked DOD for a cost justification of its proposal with IBM.

Undermines Brooks Act?

Observers are concerned this proposal, if approved by the GSA, could undermine the Brooks Act, which was designed to encourage competitive bidding on DP procurements.

The procedure being implemented between IBM and the DOD is "antithetical with the open competition provided under the Brooks Act," the government source said.

The precedent that could be set by this pact is serious because it could mean a fracturing of the GSA's central authority over DP procurements, he said.

The GSA will have a hard time holding other firms to the deadline for supply schedules, he added, because the pact encourages every agency to make its own schedule.

"If the IBM-DOD schedule pact is allowed, the government's largest procurer of computer equipment could conceivably sole-source millions of dollars worth of equipment and thus effectively squelch the competitive procuring process," the Computer Industry Association (CIA) said.

If the GSA approves the contract, "it will in effect grant DOD an authority that is not permitted the government as a whole," the CIA told the House Government Operations subcommittee.

The CIA has filed for a copy of the contract proposal between DOD and IBM under the Freedom of Information Act in order to learn the details.

Rep. Jack Brooks' (D-Texas) Government Operations Subcommittee has asked the DOD and the GSA to explain the terms of the proposal and the rationale behind the proposal.

Because IBM missed the Supply Scheduling filing deadline, the GSA made a limited contract with IBM to protect its existing IBM leased installations.

GSA Changes T/S Bidding Rules

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The General Services Administration (GSA) has decided to drop its proposed "discount benchmarking" plan for buying time-sharing services in favor of a "basic agreements" proposal that will allow vendors to qualify before discussing price, Theodore Puckorius, commissioner of GSA's automated data and telecommunications services, said in an interview here recently.

Vendors had objected to the earlier plan, which would have granted contracts only to firms that matched the highest discount offered by any firm in the competition [CW, July 30].

Under the basic agreements proposal, all vendors wishing to do business with the government have to meet a set of master terms and conditions covering such things as maintenance response time, uptime, and billing procedures, Puckorius said.

Firms willing to meet GSA's terms will be placed on a "prequalified list" of companies that could number as many as 60 vendors. Those offering similar services will be grouped together in the "Sears catalog" of time-sharing services GSA envisions, he said.

It will be up to the individual agency seeking service to assure through standard competitive solicitation it is getting the lowest possible price, he said.

Firms that make the list will include all types, ranging from small local service bureaus to national organizations offering a full spectrum of services, Puckorius said.

"I don't like the plan – it's still going to take too much paperwork on the part of the agencies involved, but it's the best one we could come up with," he admitted.

Preparation of requests for proposal (RFP) will be simplified through the use of short "check-list" order forms, he said.

A contract worth $10,000 to $25,000 will be boiled down to a one-page solicitation document, and three bids will be required, he explained. Orders of $250,000 or more will require a full-blown solicitation, with publicity in the *Commercial Business Daily* to assure fairness, Puckorius said.

The present time-sharing contract held by Computer Science Corp.'s Infonet Division expires July 1, he noted.

Although prices were increased under that contract by 5% this year, volume discounts have offset the increase to date, he said.

Tandem Aiming at 'Undominated' Sector of Market

By Molly Upton
Of the CW Staff

SANTA CLARA, Calif. – Add one more to the number of mainframe manufacturers.

The year's latest entry, Tandem Computers, Inc., has targeted a market slice it figures is less than 5% of any existing mainframer's business, and it stands a good chance of dominating that slice, according to Jim Treybig, Tandem president.

Armed with venture capitalists' backing to the tune of $3 million to date, the firm has a prototype of its Tandem 16 Nonstop system [CW, Dec. 10] and plans its first shipment April 1.

The Tandem system is aimed at the sophisticated end user who is tackling the problem of tying together two or more systems to provide a redundant capability, Treybig said.

The redundant systems market currently accounts for about $250 million in annual sales and is growing at about 30% a year, according to Sam Wiegand, the firm's vice-president.

The market should grow to about $800 million a year over the next five years, and the advent of Tandem's standard system will serve as a solution to the previously required custom programming of operating systems, he said.

"We're looking for the sophisticated end user who is looking for a system that will enable him to put his business on-line" and on which he can depend, Treybig said.

These users typically want to write their own applications programs, he said, adding one of the major advantages of Tandem's approach is an operating system, specifically designed for multiple processors, that can be up and running quickly after installation.

"Indirectly, "we're competing against every computer manufacturer," Treybig said.

Although he anticipates other firms will promote the same type of machine, he said he didn't think any others had anything similar under development now and would have to start from scratch.

Treybig said during the first year of shipments, Tandem could ship about $5 million worth, which he estimated would be between 35 and 50 systems.

Tandem's biggest market is probably financial institutions, he said, with others being communications-oriented companies, retail firms and industrial automation.

Initially backed by the venture capital firms of Kleiner & Perkins and Asset Management for $1 million, Tandem recently completed a $2 million round of private financing from Kleiner & Perkins, Henry Hillman, the Mayfield Fund, Data Science Ventures and Warburg-Pinkus.

To talk its way into funding, Tandem's concept had to offer a cost advantage to customers, increased system reliability and "functional failure modes," Treybig said.

The firm has experienced "no major problems so far," he said. All system test and integration software is done, and the firm is ahead of schedule and has spent less money than anticipated, he said.

The management is comprised principally of former managers from Hewlett-Packard (HP), some of whom also were at Kleiner & Perkins and Diablo Systems.

Treybig was formerly a partner in Kleiner & Perkins and, before that, marketing manager for HP's Cupertino, Mountain View and Data Systems divisions.

James A. Katzman, vice-president of engineering, headed the design team responsible for one of the four primary modules in the Amdahl 470 and was also one of the principal architects of the HP 3000 system.

Michael D. Green, vice-president of software development, held several software development posts at HP.

Still another former HPer is John C. Loustaunou, vice-president of finance, also formerly a partner in Kleiner & Perkins. Loustaunou served as finance and cost accounting manager of the HP Data Systems Group.

Sam Wiegand, vice-president of marketing, and Robert Marshall, vice-president of manufacturing, each held similar positions at Diablo.

David R. Mackie, product manager, who held marketing and development management posts at HP, and Horst Enselmuller, managing director of Tandem GmbH and most recently responsible for HP's computer sales in Germany, complete the management team.

Tandem is opening sales offices with DP centers and service staffs in three locations: New York City, Chicago and San Francisco, and a subsidiary, Tandem GmbH, in Frankfurt, West Germany.

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Upgrade your skills now with the EDP Seminar Series.

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A list of current seminars is given below. To register for any seminar, or if you'd like more information, just check the appropriate box and send in the coupon.

How to Increase Programming Productivity
A 2-day seminar for technical managers on the state of the art of Software Engineering. Led by John W. Brackett, PhD, Vice President of SofTech, Inc., and Clement L. McGowan, PhD, Consultant. Fees: $300, including continental breakfasts, luncheons, and all course materials. $250 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Jan. 26-27**
Chicago	**Hyatt Regency O'Hare**	**March 8-9**
Wash., D. C.	**Stouffer's National Center Inn**	**April 6-7**

Legal Tools for Computer Contracting and Protection
A 2½-day seminar that shows you how to increase your advantage in dealing with vendors that supply your installation. Includes discussion and review of your own contracts. Led by Roy N. Freed, the nationally known lawyer, author and educator in the field of computer law. Fees: $325, including continental breakfasts, luncheons and all course materials. $275 for additional registrants from the same company. Schedule:

Wash., D.C.	**Marriot Crystal City**	**Feb. 4-6**
Orlando, Fla.	**Sheraton Towers**	**Feb. 18-20**
Seattle	**Airport Hilton**	**May 19-21**

Performance Evaluation and Improvement
A 2-day seminar on measurement techniques that are designed to save your installation money. Led by Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement and improvement.* Fees: $250 per registrant, including continental breakfasts, luncheons, and all course materials. Schedule:

San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**
New York	**Summit Hotel**	**Feb. 9-10**

Data Communications Course #1010 -
Practical Data Communications Systems & Concepts
A 2-day seminar on the newest advances in data communications, including SDLC, DDS, new tariffs, equipment characteristics, and the impact of satellite carriers. Led by Dr. Dixon Doll, Teleprocessing consultant. Fees: $350, including continental breakfasts, luncheons, and workbook and reference materials. $300 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Jan. 26-27**
Chicago	**Hyatt Regency O'Hare**	**Mar. 15-16**

Data Communications Course #1020 -
Advanced Teleprocessing Systems & Concepts
A follow-up to course #1010, this 3-day seminar emphasizes techniques that minimize operating costs in commercial data communications networks. Also led by Dr. Dixon Doll. Fees: $450, including continental breakfasts, luncheons, and an extensive set of customized course materials. $400 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Feb. 23-25**

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NOTE: If time is short, you may reserve space at any seminar by calling collect. Call Miriam Ober at (617) 965-5800.

CMI Reshuffles Management After Year Ends in the Red

BEDFORD, Mass. – Promptly after revealing a loss for the year ended Aug. 31, Cambridge Memories, Inc. (CMI) reshuffled management and brought in a new president, Jerry E. Goldress, who will also serve as chief executive officer.

Goldress is a principal in the firm of Grisanti & Galef, Inc., a business and management consultant firm.

Joseph F. Kruy, formerly CMI president, has been named chairman of the board.

CMI showed a loss of $4.1 million in the year ending Aug. 31 compared with earnings of $1 million in the preceding year [CW, Dec. 17].

Survey Finds Big Hospitals Prone to Lease DP Devices

NEW YORK – The nation's largest hospitals are more likely to lease DP systems than any other type of equipment, according to a survey of community hospital financing practices conducted for Citicorp Leasing, Inc.

The survey of 447 nonfederal, short-term health care institutions of 50 beds or more showed that the larger the hospital, the more likely it is to lease its DP systems.

Seventy-one percent of hospitals with 500 or more beds lease DP equipment. The leasing incidence is 68% in 400- to 499-bed hospitals and 65% in the 300- to 399-bed category, the survey said.

Fifty-four percent of hospitals in all size groupings lease DP equipment, the survey showed.

Progress Report

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LEGEND

1. All computer figures are taken from projections of International Data Corporation, the world's largest EDP market research firm.
2. State-by-state numbers are number of *computer systems* in state.
3. Percentage figures represent percent of total U.S. computer systems installed in state, measured by value.
4. States in lighter shading are ten largest measured by value of computer systems installed. States in darker shading and Washington, D.C. are next biggest.
5. Cities shown are 1976 Computer Caravan sites. Inner circles are 100-mile radius from city. Outer circles (where shown) are 200-mile radius from city.

Going your way is our way.

Computer Caravan/76 brings a national computer conference to key computer-using states across the country.

Measured by value of computer systems installed, the ten largest states in the U.S. (lighter shading on map) account for more than 60% of all computer systems in the United States. Adding the next biggest areas - 7 states and the District of Columbia (darker shading on map) - we get almost 80% of all the U.S. Computer Installations, measured by value. And it's these key states in the computer world which will be host to - or nearby - one or more of the nine cities in the Computer Caravan/76 - the travelling computer users' forum and exhibition sponsored by *Computerworld*.

To general and data processing management, this means a unique opportunity to see a national computer show without leaving the office for a week and travelling across the country. It's a chance to keep up on the latest information in our user-to-user forums and on the latest products and services in our complete exhibition.

And thousands of key business executives will take advantage of this opportunity as the Caravan moves across the country. The '76 Caravan can expect attendance of over 30,000, and unlike any other computer show, they will represent the majority of the computer installations in the 17 states and the District of Columbia -- that account for 80% of all U.S. computer systems installed. That's true national coverage.

As a marketer of data processing products and services, the Computer Caravan offers you a unique opportunity to meet the professionals who run our country's computer installations in a one-to-one, business oriented atmosphere. Because there are 27 different show days, no one Caravan day is too crowded to give you the opportunity to present your products or services in detail - either on our exhibit floor, or in your own product seminar. And the 1976 Caravan offers several innovations which can make it more suitable to your individual marketing problems:

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2. For companies specializing in the OEM market, there is our new companion show, COMPDESIGN 76. Sponsored by *Computer Design* magazine, this show will appear in the same halls with the Computer Caravan in five key OEM markets: Boston, New York, Chicago, San Francisco, and Los Angeles. It will attract thousands of key computer designers, and will also be open to Caravan attendees in those cities.

3. Data communications marketers can take advantage of our DATACOMM 76 add-on, which gives you a spot in the national data communications show sponsored by *The Data Communications User* magazine.

There's a lot more we'd like to tell you about Computer Caravan/76, but if you're interested in exhibiting, time is short. So send in the coupon right away.

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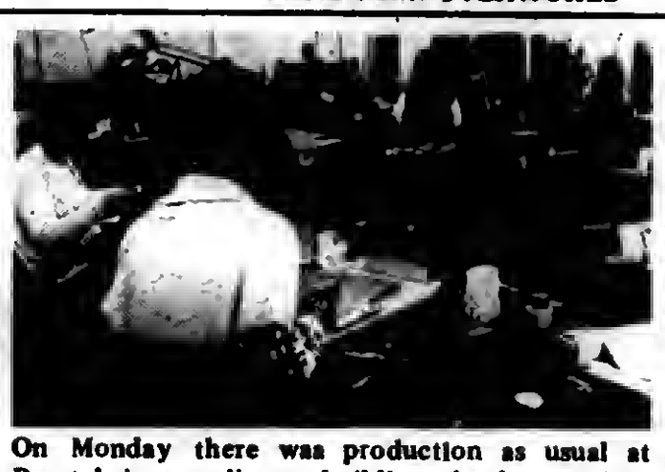
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On a Saturday, fire destroyed the roof structure over the furnace area at Ramtek Corp. and rendered 10,000 sq ft of space unusable.



On Monday there was production as usual at Ramtek in an adjacent building, thanks to volunteer action of employees over the weekend.

After Fire Destroys Plant

Employees Help Keep Lost Time Low

SUNNYVALE, Calif. – Quick action over a weekend by Ramtek Corp. employees enabled the maker of multicolor graphics displays to be back in production Monday morning, after a fire on Saturday morning had rendered about 10,000 sq ft of manufacturing space unusable.

The fire, which appears to have started in a bank of burn-in furnaces, was spotted at 3 a.m. Saturday.

By 5 a.m., the blaze had been extinguished, and concerned employees and their families were already gathering at the scene.

Within a few hours, floor space had been cleared in an adjacent building, and salvagable tools, instruments, supplies and work benches were being moved out of the fire area, cleaned up and moved in.

"To say that we had come out of this unscathed would be ridiculous," said President Charles McEwan, "but, because of these truly fantastic people here, our losses in time will now be counted in weeks instead of months.

"For example, we had a system in here that was to have been shipped to the Jet Propulsion Laboratory in Pasadena, Calif. on that Wednesday. It was totally destroyed in the fire."

Ramtek managed to meet the original shipping date of Wednesday, he said.

"For our current orders, we expect delays of no more than three to six weeks, McEwan said. For new orders, we are quoting 90 days. We are also confident that a new, full-scale manufacturing facility will be completed and in full production in about three months."

Remex Floppy Disk Drive Accepts Hard-, Soft-Sectored Diskettes

SANTA ANA, Calif. – Remex has introduced the RFD 7400E flexible disk drive, which accepts IBM-formatted soft-sectored diskettes as well as 32-hole hard-sectored diskettes.

The 7400E, which Remex calls a "universal" drive, includes its own unit select decoding circuitry allowing four drives to be attached to a single interface cable and permitting four drives to be controlled by one set of drivers and receivers in the host system. Any of the drives can be addressed by a two-digit binary number.

The unit, which sells for $650 in single quantities with OEM discounts available, is said to increase the total capability of flexible disk technology in OEM systems while reducing the logic requirement in the host system.

The 7400E includes a multi-drive seek capability, which allows up to four units to seek new tracks simultaneously while the CPU is free to perform other tasks, Remex said.

Remex is at 1733 Alton St., 92705.

Orders & Installations

Wentworth Institute has ordered a PDP-11/70 from Digital Equipment Corp. to support both instructional and administrative functions at the school.

The city of Chattanooga's DP department has ordered Control Data Corp. peripherals to replace IBM equipment. The units include a 33145 memory, a 38031 tape controller, five 34201 tape drives, two 38301 disk controllers, eight 33301 disk units and a 2821 printer with integrated controller and a 14161 printer train.

The Naval Electronics Systems Command has ordered Dataproducts Corp.'s Model 2910 militarized teleprinters for use in shipboard communications systems.

The Energy Planning Division of Montana's Department of Natural Resources has installed Broomall Industries' GP-100 graphics processing system for use in Montana's utility facility siting study.

Applied Business Services has installed Diva, Inc.'s DD-50 series mass storage system.

POSITION ANNOUNCEMENTS

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TO 19K FLA. LOCATION - Expanding IBM-370 Installation, 3 years of COBOL. Individual must be capable of coordinating a user department and working alone. Located 40 miles NE of Tampa. Salary history and requirement. Send resume to Pasco County Data Processing, 410 E. Meridian Avenue, Dade City, FL 33525
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Please send resumes and salary requirements to Richard Stahle, Industrial Relations Manager, Crompton & Knowles Corp., 93 Grand St., Worcester, Mass. 01613, Tel. (617) 753-5431 ext. 245.

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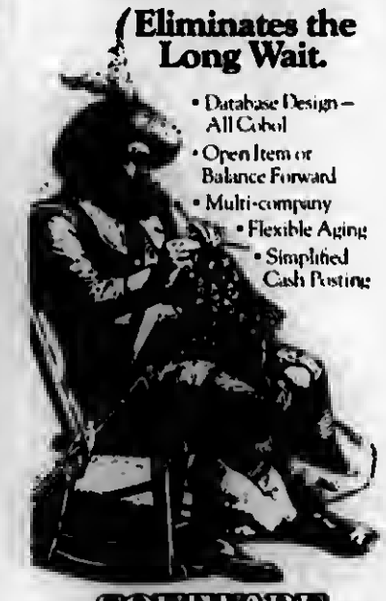
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Microdata Gains 71% in Year

IRVINE, Calif. – Microdata Corp.'s earnings rose 71% for the year ended Aug. 31 following a record quarter for the firm during the last period.

During the fourth quarter the firm earned $753,647 or 48 cents a share, including a $367,000 tax credit, compared with a loss of $99,610 or 6 cents a share in the same period last year.

Revenues during the three months rose to $5.3 million from $4.3 million in the same period last year.

For the year, Microdata revenues totaled $15.9 million compared with $13.8 million during 1974, while earnings soared to $1.1 million or 71 cents a share compared with $641,466 or 41 cents a share last year.

There was a tax credit of $501,000 compared with $265,000 for 1974.

Triple in Nine Months

Inforex Earnings Climb 31% in Quarter

BURLINGTON, Mass. – Inforex, Inc.'s earnings for the third quarter rose 31% and more than tripled in the nine months over figures for the comparable year-ago periods.

Earnings for the quarter rose to $297,000 or 10 cents a share compared with $226,000 or 8 cents a share in the same period last year.

Orders for systems during the quarter exceeded the depressed levels experienced during the second quarter, the firm said.

Quarterly revenues rose 5% to $13.7 million compared with $13.1 million in the year-ago period. There was $1.1 million in sales to Inforex's Leasing II in the recent period.

Although leases recorded as sales and other sales declined by about $1 million each, rental and service revenues grew 27% in the quarter to $7.2 million compared with $5.7 million in the same period last year.

During the quarter, Inforex purchased several hundred data entry systems it had sold to Leasing II under a third-party purchase agreement.

The repurchase is expected to add significantly to profits in the current and future quarters, the firm said.

Nine-month revenues grew 16% to $41.5 million, including $2.6 million in sales to Leasing II, compared with $35.6 million in the same period last year.

Rental and service income rose to $20.3 million from $15.8 million in the year-ago nine months.

Earnings for the nine months soared to $602,000 or 21 cents a share compared with $164,000 or 6 cents a share in the same period last year.

President Timothy C. Cronin cited continuing margin improvement.

"Gross profits as a percent of revenues edged up by a point and a half, while expenses for engineering, selling and administration as a percent of revenues dropped by over four points," he said.

Reliance Posts Third-Quarter Loss

NEW YORK – Reliance Group, Inc. posted a third-quarter loss of $17.5 million, reflecting losses from its decision to sell off its time-sharing operations, Leasco Response, Inc. and Leasco Response Ltd.

The loss included a $2.9 million operating loss, $2.2 million on the sale of securities, $7.2 million on the discontinued domestic and foreign time-sharing operations and an extraordinary loss of $5.3 million.

Revenues rose to $225.9 million from $195.3 million in the year-ago period.

For the nine months, the firm lost $23.2 million compared with earnings of $11.3 million in the same period last year.

The loss included an operating loss of $16.1 million, capital gains of $3.8 million, an $8.1 million loss on discontinued time-sharing operations and an extraordinary loss of $2.7 million, the firm said.

Nine-month revenues totaled $648.7 million compared with $573.1 million during the same period last year.

AUSTRALIA

Authentic information is freely available **WITHOUT CHARGE** from the Australian Embassy in Washington, D.C. (202) 797-3000, and the Australian Consulate General in New York (212) 245-4000, San Francisco (415) 362-6160, Los Angeles (213) 380-4610 and Chicago (312) 329-1740.

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Earnings Reports

STORAGE TECHNOLOGY
Three Months Ended Sept. 26

	1975	a1974
Shr Ernd	$.40	$.34
Revenue	27,344,000	20,626,000
Earnings	1,703,000	1,383,000
9 Mo Shr	1.06	.95
Revenue	69,455,000	56,313,000
Earnings	4,464,000	3,806,000

a-Restated.

UNITED COMPUTING
Year Ended June 30

	1975	1974
Revenue	$3,662,326	$2,280,362
Loss	180,140	49,384

MSI DATA
Three Months Ended Sept. 27

	1975	a1974
Shr Ernd	.....	$.22
Revenue	$7,175,220	8,366,488
Disc Op	(1,421,598)	(198,752)
Earnings	(1,341,316)	423,564
6 Mo Shr	.....	.38
Revenue	15,427,694	15,833,937
Disc Op	(1,564,354)	(429,013)
Spec Cred	.....	b99,985
Earnings	(1,122,072)	742,250

a-Restated for discontinued operations. b-Cumulative effect of accounting changes from prior periods.

VANIER GRAPHICS
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.24	a$.24
Revenue	6,435,996	5,035,859
Earnings	245,032	254,022
6 Mo Shr	.47	a.44
Revenue	12,419,363	9,510,458
Earnings	484,384	462,241

a-Reflects 8% stock dividend in August 1974 and three-for-two stock split in July 1975.

GREYHOUND COMPUTER
Three Months Ended Sept. 30

	a1975	1974
Shr Ernd	$.04	$.08
Revenue	15,242,000	13,236,000
Earnings	161,000	b334,000
9 Mo Shr	.07	.25
Revenue	46,412,000	39,705,000
Earnings	301,000	b1,080,000

a-includes results of Computer Leasing Co., purchased in December 1974. b-includes $118,000 gain on sale of investment.

MARTIN MARIETTA
Three Months Ended Sept. 30

	1975	a1974
Shr Ernd	$.86	$1.11
Revenue	290,113,000	323,021,000
Earnings	21,416,000	27,237,000
9 Mo Shr	1.68	2.68
Revenue	782,333,000	918,686,000
Earnings	b41,429,000	63,875,000

a-Restated for Lifo accounting. b-Includes $5.3 million net gain from sale of real estate.

PRIME COMPUTER
Three Months Ended Sept. 28

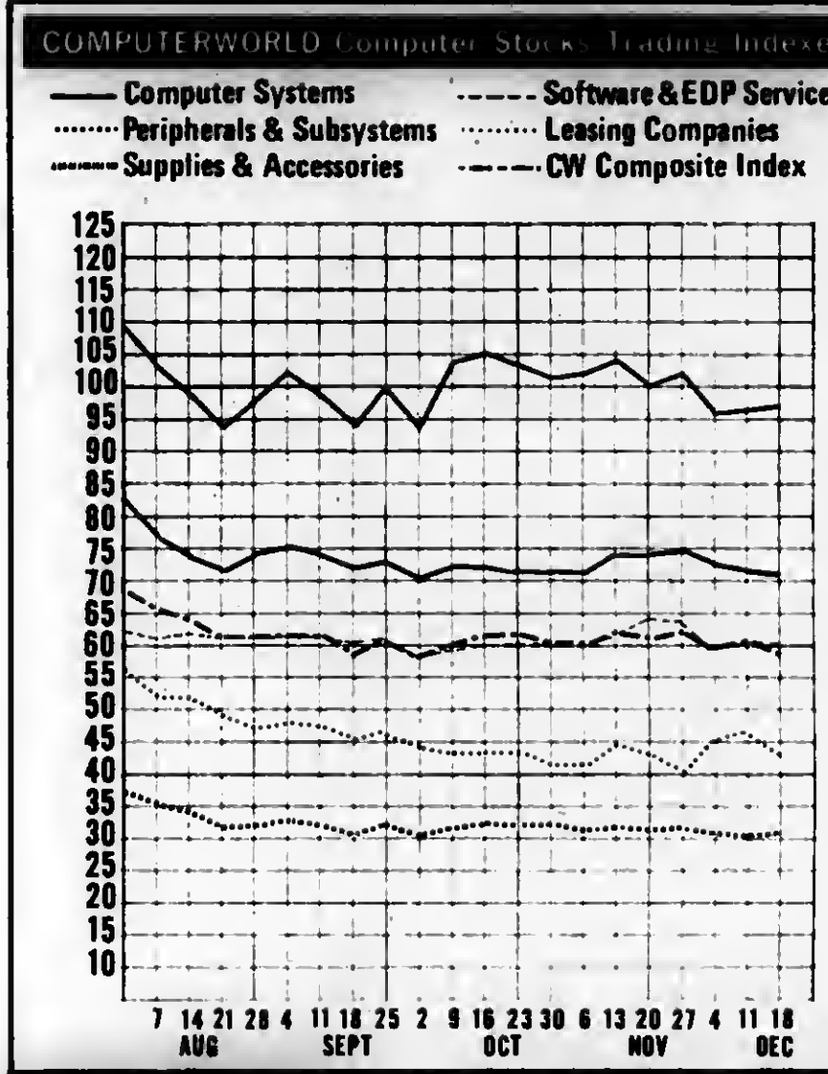
	1975	1974
Shr Ernd	$.10	.....
Revenue	2,994,387	$1,760,709
Tax Cred	111,700	7,479
Earnings	202,101	(139,295)
9 Mo Shr	.20	.....
Revenue	7,910,491	4,452,815
Tax Cred	211,700	42,539
Earnings	410,817	(546,375)

T-BAR
Three Months Ended Sept. 30

	1975	a1974
Shr Ernd	$.18	b$.13
Revenue	1,135,332	1,094,386
Earnings	75,358	54,615
9 Mo Shr	.53	b.34
Revenue	3,443,242	2,841,832
Earnings	223,305	142,183

a-Restated. b-Adjusted for a 5% stock dividend paid in April 1975.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, DECEMBER 17, 1975

All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

EXCH		PRICE 1975 RANGE (1)	CLOSE DEC 17 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	85 1/4	+ 3/4	+0.8
C	COMPUTER AUTOMATION	2- 11	9 1/4	- 3/8	-5.8
A	CONTROL DATA CORP	11- 23	17 5/8	+ 5/8	+2.1
N	DATA GENERAL CORP	10- 59	56 3/8	+2 3/8	+6.9
O	DATAPOINT CORP	6- 26	21 1/4	0	0.0
C	DIGITAL COMP CONTROL	1- 4	1 1/2	0	0.0
N	DIGITAL EQUIPMENT	46-140	130 5/8	+4	+3.1
N	ELECTRONIC ASSOC.	2- 5	2	+ 1/8	+6.4
A	ELECTRONIC ENGINEER.	5- 10	7 5/8	- 1/8	-1.6
N	FORRORO	25- 42	27 5/4	+ 5/8	+1.3
O	GENERAL AUTOMATION	4- 14	5 1/8	- 7/8	-14.5
C	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	58-120	94 5/4	+ 1/4	+0.2
A	HONEYWELL INC	22- 40	52 1/8	- 1/4	-0.7
N	IBM	158-224	219 5/4	+2 1/4	+1.0
C	MEMCRER	1- 10	7	- 1/2	-6.6
O	MICRODATA CORP	2- 10	9 1/2	+1	+11.7
O	MODULAR COMPUTER SYS	5- 19	10 1/4	+ 1/4	+2.5
A	NCR	15- 39	22 5/4	+1 1/4	+5.8
C	PRIME COMPUTER INC	2- 6	4	+ 1/4	+6.4
A	PERKIN-ELMER	16- 30	22 5/8	+ 5/8	+2.8
N	RAYTHEON CO	26- 59	44 3/4	+1 3/4	+4.0
N	SINGER COMPANY	9- 17	9 3/8	- 1/8	-1.2
N	SPERRY RAND	26- 49	57 3/4	- 1/4	-0.4
A	SYSTEMS ENG. LABS	1- 5	4 1/4	+ 1/4	+6.2
A	VARIAN ASSOCIATES	7- 18	11 7/8	- 7/8	-4.8
N	WANG LABS.	7- 17	9 3/4	- 1/4	-2.5
N	XEROX CORP	47- 86	48 1/8	-1 1/8	-2.2
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	3 5/4	- 1/8	-3.2
A	COMMERCE GROUP CORP	2- 4	2 1/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	5/8	- 1/8	-14.6
P	DATRONIC RENTAL	1- 1	1/4	- 1/4	-50.0
A	DCL INC	0- 1	1/4	- 1/8	-28.3
N	DPF INC	5- 4	4 3/8	+ 1/8	+2.7
O	EGP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 1/2	- 1/8	-4.7
N	ITEL	3- 9	3 3/8	0	0.0
N	LEASCO CORP	A- 8	3 7/8	0	0.0
O	LFASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
C	NRG INC	0- 4	5/8	0	0.0
A	PIONEER TEX CORP	2- 7	4 7/8	- 3/8	-7.1
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	7	- 1/8	-1.7

EXCH: N=NEW YORK; A=AMEALCAN; P=PHIL-BALT-WASH; L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		PRICE 1975 RANGE (1)	CLOSE DEC 17 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	1	0	0.0
A	APPLIED DATA RES.	1- 10	1 5/8	+ 5/8	+50.0
N	AUTOMATIC DATA PROC	29- 65	54 1/4	+ 5/8	+1.1
C	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COMPUTER DIMENSIONS	2- 6	5	0	0.0
C	COMP ELECTION SYSTMS	5- 7	4 5/4	- 1/4	-5.0
O	COMPUTER HORIZONS	1- 1	1/2	- 1/8	-20.0
C	COMPUTER NETWORK.	1- 5	1 5/8	- 1/4	-15.5
N	COMPUTER SCIENCES	2- 6	5 5/4	+ 1/8	+5.4
O	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
C	COMPUTER USAGE	2- 4	2 7/8	+ 5/8	+15.0
C	CONSHARE	2- 4	2 1/8	- 3/8	-15.0
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	11	- 5/8	-5.2
O	INFONATIONAL INC	1- 1	1/8	- 1/8	-50.0
C	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
O	KEANE ASSOCIATES	2- 5	2 5/8	- 1/4	-8.4
C	KEYDATA CORP	2- 4	5	- 1/2	-14.2
C	LOGICON	5- 5	5 3/8	0	0.0
A	MANAGEMENT DATA	1- 3	1 5/8	+ 1/4	+18.1
A	NATIONAL CSS INC	6- 14	9 5/8	+ 1/8	+1.3
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	12 7/8	+1 5/8	+11.9
N	PLANNING RESEARCH	2- 6	2 7/8	0	0.0
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
C	RAPIDATA INC	2- 3	4	+ 1/2	+14.2
O	REYNOLDS & REYNOLD	10- 24	13 1/2	- 1/4	-1.8
C	SCIENTIFIC COMPUTERS	1- 1	5/8	- 5/8	-37.3
O	SIMPLICITY COMPUTER	1- 1	1 1/4	0	0.0
O	TYMSHARE INC	7- 21	19 1/4	+1 5/4	+10.0
A	URS SYSTEMS	2- 4	5 3/8	+ 5/8	+22.7
N	WYLY CORP	2- 4	2 5/4	- 1/8	-4.3
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	7 1/2	0	0.0
O	ADVANCED MEMORY SYS	1- 7	3 7/8	+ 1/8	+3.3
N	AMPEX CORP	5- 7	4 1/2	- 1/4	-5.2
C	ANDERSON JACOBSON	1- 5	1 5/8	- 1/8	-7.1
O	BEEHIVE MEDICAL ELEC	1- 3	5 5/8	+ 1/4	+8.0
A	BOLT,BERANEK & NEW	5- 13	4 7/8	- 1/8	-1.7
N	BUNKER-RAMO	4- 8	5 5/8	- 1/4	-6.4
A	CALCOMP	3- 7	5 1/4	0	0.0
O	CAMBRIDGE MEMORIES	1- 3	1 7/8	- 1/8	-6.2
N	CENTRONICS DATA COMP	7- 23	18	+ 1/8	+0.6
O	CODEX CORP	15- 58	28	-2	-6.6
C	COGNITRONICS	1- 2	3/4	+ 1/8	+20.0
O	COMPUTER COMMUN.	1- 2	7/8	- 1/8	-12.3
C	COMPUTER CONSOLES	3- 7	4	+ 1/2	+14.2
A	COMPUTER EQUIPMENT	1- 2	1 1/8	- 1/8	-10.0
C	COMPUTER MACHINERY	1- 2	1	+ 5/8	+60.0
O	COMPUTER TRANSCEIVER	1- 2	3/4	- 1/8	-14.2
C	COMTEN	2- 3	3 1/8	0	0.0
N	CONRAC CORP	12- 30	26 7/8	+ 7/8	+3.3

EXCH		PRICE 1975 RANGE (1)	CLOSE DEC 17 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 5	2	0	0.0
C	DATA 100	5- 16	8 1/A	- 1/2	-5.7
A	DATA PRODUCTS CORP	2- 4	3 5/8	0	0.0
O	DATA TECHNOLOGY	1- 3	1 1/8	- 1/8	-10.0
C	DATUM INC	1- 2	7/8	+ 3/8	+75.0
C	DECISION DATA COMPUT	2- 7	2 7/8	0	0.0
O	DELTA DATA SYSTEMS	1- 1	1/8	- 1/8	-50.0
O	DIAN CONTROLS	1- 1	5/4	0	0.0
N	ELECTRONIC M & M	1- 3	1 1/4	+ 1/8	+11.1
C	FABRI-TEK	1- 1	5/8	- 1/8	-16.6
O	GENERAL COMPUTER SYS	1- 2	2	- 1/4	-11.1
N	HAZELTINE CORP	3- 4	5 1/8	0	0.0
N	HARRIS CORP	18- 33	51 7/8	+2 5/8	+8.9
A	INCOTERM CORP	5- 12	8	0	0.0
C	INFORER INC	2- 5	2 5/4	+ 5/8	+15.7
O	INFORMATION INTL INC	8- 14	10	+ 1/4	+2.5
A	LUNDY ELECTRONICS	5- 6	5	0	0.0
O	MANAGEMENT ASSIST	1- 1	5/8	+ 1/8	+25.0
A	PILGO ELECTRONICS	8- 24	15	+ 7/8	+6.1
N	MOHAWK DATA SCI	1- 5	5 1/8	- 1/8	-5.8
C	OPTICAL SCANNING	1- 3	1 1/2	- 3/8	-20.0
C	PENRIL CORP	2- 2	1	0	0.0
O	PERTEC CORP	2- 8	5 7/8	+ 5/8	+10.7
A	POTTER INSTRUMENT	2- 2	1 5/4	0	0.0
C	PRECISION INST.	1- 1	3/8	- 1/8	-25.0
O	QUANTOR CORP	2- 6	5 7/8	- 3/8	-8.8
O	RECOGNITION EQUIP	2- 9	6 1/8	+ 5/4	+15.9
N	SANDERS ASSOCIATES	3- 11	5 5/4	- 3/8	-6.1
C	SCAN DATA	1- 5	1 5/4	0	0.0
O	STORAGE TECHNOLOGY	6- 17	10 1/8	- 1/4	-2.4
O	SYCOR INC	5- 22	18	+1 5/4	+10.7
O	T EAP INC	5- 6	6 1/4	0	0.0
O	TALLY CORP.	1- 5	2 1/4	- 1/4	-10.0
C	TEC INC	1- 4	1 3/A	0	0.0
N	TEKTRONIX INC	18- 45	4A 1/4	+ 1/4	+0.5
N	TELEX	1- 5	2	0	0.0
O	WANGCO INC	4- 9	8 3/8	+ 7/8	+11.6
C	WILTEK INC	1- 4	1	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 1/4	0	0.0
A	BARRY WRIGHT	5- 7	5 1/4	- 1/4	-4.5
O	CYBERNATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	29 1/4	- 5/4	-2.3
O	DUPLEX PRODUCTS INC	12- 23	16 1/2	- 1/2	-2.9
A	ENNIS BUS. FORMS	5- 7	3 5/8	+ 1/8	+2.5
O	GRAHAM MAGNETICS	5- 10	8 1/2	- 1/4	-2.8
O	GRAPHIC CONTROLS	8- 21	11 3/4	- 1/4	-2.0
N	SN COMPANY	45- 48	58 5/4	+1	+1.7
C	MCORP CORP LTD	59- 31	47 1/2	+1 3/4	+3.8
N	NASHUA CORP	9- 22	9 1/2	0	0.0
O	STANDARD REGISTER	11- 20	14 1/4	0	0.0
O	TAB PRODUCTS CO	4- 8	4 1/2	0	0.0
N	UARCO	17- 24	19 7/8	- 1/8	-0.6
C	VANIER GRAPHICS CORP	4- 7	4 3/4	0	0.0
A	WABASH MAGNETICS	3- 3	3 5/8	0	0.0
N	WALLACE BUS FORMS	15- 23	18 1/2	0	0.0

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NEWSPAPER

DP Nightmare

By Nancy French
Of the CW Staff

Christmas holiday travel arrangements, which under normal conditions can produce headaches for passengers and travel agents alike, became a nightmare this year when United Air Lines was struck.

The walkout by machinists flooded the computer-based communications/reservations systems of the entire airline industry with millions of messages a day aimed at rebooking passengers on alternate flights.

Passengers who were lucky enough to hook flights on other carriers arrived at airports all over the country with tickets in hand only to find their names were not on the passenger lists for the flights they had booked, according to Donald Sohn, president of Heritage Travel Service of Cambridge, Mass.

While the system didn't collapse, the crisis gave industry officials a taste of a 24-hour-a-day peak load operation they haven't experienced before, one official said.

Airlines sell space not only on their own flights, but also on all other carriers' flights by communicating with each other's computers via Arinc, a private communications network operated for the airline industry by Aeronautical Radio, Inc., Sohn explained. The network is largely high-speed Teletypes.

When a flight is nearly booked, the airline's computer system sends an "inhibit message" to any travel agent or other airline that attempts to hook space on that flight, telling them not to sell any more space.

"Somehow, these messages didn't get through," Sohn said. "Flights were oversold, and no one really knew it until clerks printed out lists of ticketed passengers and discovered the problem."

Secondly, according to Sohn, messages that were queued up waiting to

(Continued on Page 3)

IBM, Two Partners Slate Satellite Service for '79

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – IBM and its partners will begin providing domestic satellite services to users in 1979, according to a proposal filed last week with the Federal Communications Commission (FCC).

IBM is one of the major partners in Satellite Business Systems (SBS), which will carry on the earlier proposals made by CML Satellite Corp. The other partners are Comsat General Corp. and Aetna Life & Casualty.

The SBS application complied with FCC restrictions set forth in early 1975 that gave IBM and Comsat General several alternative ways to enter the satellite business [CW, Feb. 5]. IBM and Comsat General chose to enter with a third partner, which was Aetna [CW, Oct. 8].

The SBS satellite services will operate in the 12- and 14 gHz bands offering all-digital services combining voice, digital and image communications, SBS told the commission. Included will be "direct access to fully switched, multimegabit/sec data transmission."

The SBS satellite network was described as "substantially different from those of other domestic satellite" carriers. Instead of relying on a few large earth stations and interconnection with existing carrier landlines, SBS said its system will provide "much more than just point-to-point bandwidth.

"In particular, SBS proposes to provide multipoint private networks with switched and dedicated capabilities consisting of voice, data and image communications services dynamically adaptable to a customer's needs.

"Within the parameters set by the customer, the system will dynamically allocate transmission capacity among the various classes of traffic among the [user's] network locations," SBS said.

The system will use "small earth stations incorporating innovative modulation and access equipment located on the customer's premises. These small earth stations will reduce the customer's dependency on local communications access facilities," the SBS application said.

"Analog voice traffic will be converted to a digital format and will be combined with data and image traffic as part of a

(Continued on Page 2)

Bad Blood Between Attorneys?

Courtroom Clash Disrupts U.S. vs. IBM

By Edith Holmes
Of the CW Staff

NEW YORK – Contentious tactics or genuine animosity?

Chances are that both motivations were behind a recent courtroom debate among attorneys for the government, lawyers for IBM and the judge hearing the U.S. vs. IBM antitrust case here.

Touched off by the government's objection to IBM's "vague" use of the terms "equipment" and "electronic data processing manufacturers" in its cross-examination of a former RCA employee, the discussion involved all the principal participants in the proceedings, included a certain amount of name-calling and, so far as such interests as "truth" and "justice" were concerned, wasted 20 to 25 minutes of taxpayers' and IBM stockholders' time and money.

Government attorney Peter Goldberg had objected to IBM counsel Paul Dodyk's undefined use of "equipment" and "EDP" in his examination of Edwin S. McCollister, once with RCA and now in charge of Burroughs' international market development.

Goldberg had made the objection before, and the IBM attorney had spent two hours going through the government's direct examination of McCollister, asking the witness to define every reference to these terms.

The defense had referred to the definitions for "equipment" and "EDP" used in a glossary of DP terms entered jointly by the parties over a month ago and stated it would intend those definitions by its use of the words unless it stated otherwise.

Nevertheless, Goldberg objected to the use of these words once again, and Judge David N. Edelstein said from the bench, "I think that's an appropriate objection. I am really getting fed up as to this. I can't understand why we can't define these terms as they are intended to be used, and I insist upon it.

"Whatever your definition may be, indicate to this witness what at least you mean 'equipment' or 'electronic data processing,' " he said.

Dodyk referred to the time spent attempting to define these terms as they were used on direct

"Yes, and I had no difficulty understanding most of his answers," the judge responded. "I read them in context but, if there is going to be any question about it, I insist that we define our terms."

"Your Honor, I simply fail to under-

(Continued on Page 3)

Independent Authority to Regulate UK Data Banks

By Joseph Hanlon
Special to Computerworld

LONDON – An independent authority will regulate both government and private data banks here, the government announced last month in its long-awaited white paper, "Computers and Privacy."

The authority "will consist of people with knowledge and experience of computers," the white paper noted.

"The time has come when those who use computers to handle personal information can no longer remain the sole judges of whether their own systems adequately safeguard privacy," the white paper declared.

The paper has been the center of a bitter three-year battle in the corridors of Whitehall [CW, Dec. 11, 1974], and the civil servants have won a number of concessions.

Their strongest victory is that – despite the view that the time for action has come – all that is to happen now is the appointment of another committee, the Data Protection Committee.

The committee, members of which will be appointed this month, will report in 18 months on possible legislation, including privacy guidelines and methods of establishing the proposed data bank authority. Thus, any legislation will be at least three years away.

But the privacy advocates won the three most important points. The government admitted data banks need regula-

(Continued on Page 2)

Seattle Ends Bidding Dilemma By Accepting County's Free Offer

Special to Computerworld

SEATTLE – Several months after two contenders for a facilities management contract effectively knocked each other out of the running, Seattle has accepted surrounding King County's offer to share its DP facility for three years – free.

The offer was almost too good to be true, and skeptical city officials were at first reluctant to accept it. "There's no such thing as a free lunch," Councilman Randy Revelle was quoted as saying in the local press.

But King County Administrator Charles Collins apparently managed to allay the City Council's fears. He told the council the county has surplus computing capacity and indicated the offer could eventually lead to a shared city/county center.

In addition, Collins said "cooperation between the governments to date has been at best discouraging and at worst disgraceful."

Joining with the county means Seattle will begin utilizing one of the county's twin 370/155s and gradually convert from the city's present NCR 251 machine language shop.

With the offer, Seattle hopes to lop $300,000 off its projected 1976 DP budget of about $5 million.

The City Council's acceptance of the county's offer brought an end to a controversy begun when Computer Sciences Corp. won the bid for a facilities management contract from the city. Boeing Computer Services, a local firm, protested the decision, charging improprieties in the selection and award process [CW, Nov. 12].

After several weeks of City Council hearings, both bids were rejected because of "flaws in the competitive bidding process" and "attempts to influence city evaluators improperly."

Notice to Subscribers

This is *Computerworld*'s annual combination issue and carries the dates of Dec. 31 and Jan. 5.

Starting with this issue, *Computerworld* will be dated on Mondays instead of Wednesdays, as has been the practice in the past.

This change reflects improved circulation and production practices that permit earlier deliveries.

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Private Sector Not Excluded

Outside Authority to Regulate UK Data Banks

(Continued from Page 1)

tion; it accepted the proposal that the regulatory authority should be independent of the government; and it agreed the authority's domain would include both government and private data banks.

The problem will now be the membership of the committee and the form it picks for the authority. The white paper says the committee is to consider two different approaches: either registration and licensing or merely investigation of complaints.

The former is followed in the U.S. and Sweden and even in Britain, which has a Consumer Credit Act that involves registration of credit bureaus.

The second choice appeared to contradict an earlier statement in the white paper that "the existence and purpose of . . . information systems should therefore be publicly known, as well as the categories of data which they handle, what they do with the data and which interests have access to the data."

The second option is seen as a sop to the civil servants, giving them another chance to argue against outside control of government computers.

The core of their argument appeared in a companion civil service paper, "Computers: Safeguards for Privacy," which discussed the government's more than 220 computer data banks.

This document argued that the parliamentary ombudsman already has the power to investigate breaches of confidence with respect to government computers.

Thus, if the Data Protection Committee can be convinced to take the second choice, the civil servants will then argue the authority need not apply to government.

The committee is also to establish "a set of objectives to set standards governing the use of computers." Although these will be included in the law setting up the authority, they "need not be enforceable by civil or criminal processes."

Rather, they are likely to be that curious British object, the code of practice. Codes are not enforceable in law, but code violations are admissible in court as evidence of misconduct.

For example, many driving regulations which are incorporated in law in the U.S. are only in the "Highway Code" in Britain. Violations of the code are used as evidence of dangerous driving, rather than treated as offenses.

But the white paper stressed the objectives "must be more than mere declarations of broad principle and must set the standards with a sufficient degree of particularity."

The objectives are to include the right of people to know about data banks and to access and correct files. But the paper emphasized "the operator of the system should be responsible for ensuring its accuracy and relevance."

Other objectives are that people asked to provide data should know for what purpose it is to be used and that personal information should be collected only if it is necessary for the declared purpose.

Finally, transfers of data from one data bank to another should not be permitted "unless they are expressly sanctioned by law or agreement, or are subject to the scrutiny and control" of the data protection authority.

But that data protection authority will be severely limited from the start by the exclusion of all the data banks that have been most controversial from some or all of the rules.

Police and national security data banks are totally outside its purview. Medical and social work records will not be shown to people if a doctor or social worker considers this in the subject's "best interests."

IBM and Partners File With FCC To Start Satellite Service in '79

(Continued from Page 1)

single multiapplication network able to handle virtually all of the customer's internal communications."

The high hit rate will allow normal telephone quality on the digitized voice transmissions, the application said, and the rooftop earth stations will provide access to high transmission speeds without requiring the customer to rely on wideband terrestrial facilities.

The network will utilize Time Division Multiple Access (TDMA) which will handle a bit stream of "tens of millions of bits per second" and make it impractical to intercept communications, SBS said.

Privacy equipment can be added to digital and voice communications in the system, "Demand assignment" techniques will be used for "advanced data processing applications," SBS said.

Preoperational Network

In order to develop its satellite capabilities, SBS will establish a preoperational network to serve seven IBM locations for in-house communications.

The first two sites in this internal network will be at IBM locations in Poughkeepsie, N.Y., and Los Gatos, Calif. The system will use facilities supplied by existing domestic satellite carriers operating in the 4- and 6 gHz bands.

When the full SBS system begins serving customers in 1979, "all access ports will be compatible with conventional telephone interfaces for voice-grade traffic" and "with established industry standards in the case of digital data inputs. This will allow customers to connect their existing terminal equipment, provided it adheres to such standards," the application said.

SBS access ports will accept bit streams regardless of their character code, message content or line protocol. Data line control techniques will be external to the SBS system facilities and under the control of users, SBS said.

The SBS earth stations will be about 16- or 23 ft in diameter and can be sited on rooftops or open areas. Modulation and access equipment at each station will perform digital coding of voice-grade signals, echo suppression, switching and multiplexing.

The system will include two satellites, one primary and one backup, each with an expected seven-year life. Each satellite will have eight transponders and service will be available in the 48 contiguous states.

The SBS filing apparently was a "radio application," according to an FCC staff source. This means it did not contain as much detail about types of services to be offered as would be required in a so-called "214" application.

If the filing is accepted by the commission, interested parties will have 30 days to respond. It is expected this response period will include most of the month of January, the FCC source said.

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Courtroom Clash Disrupts U.S. vs. IBM Antitrust Trial

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stand why it is that in the context of the cross-examination the word 'equipment' is so much more difficult to understand than it was during direct," the IBM attorney said.

"You are being smart-alecky, aren't you? . . .I don't understand your questions as they are being framed. Is that sufficient? I see no reason why we have to have slippery use of terms," Edelstein stated.

With that, lead IBM counsel Thomas D. Barr rose to his feet. Barr said he had to object to the judge's characterization of counsel for IBM as "slippery."

"I think Your Honor is disrupting the cross-examination of this witness. I think Your Honor started disrupting the cross-examination of this witness this morning and I ask Your Honor, please, in the interest of justice, to refrain from doing it," Barr said.

Judge's Conduct

After dealing specifically with the problem posed by the word "equipment," Barr expanded the issues being discussed to include the judge's conduct during all cross-examinations. He said Edelstein was being led into error by government counsel.

"Your Honor has repeatedly interrupted and instructed the witness . . . during the cross-examination, about how to answer questions. On the other side of it, during direct examination Your Honor has allowed the witnesses to speculate and to surmise and to answer on the basis of hearsay, I believe, Your Honor, far beyond anything I have ever seen before," Barr said.

The defense attorney asked that, accordingly, the scope of the cross-examination in this case be permitted to be "extraordinarily broad . . . the broadest, most uninterrupted kind of cross-examination known to any court in this country."

The judge suggested even such a cross-examination must be "consistent with justice and consistent with fair play." He added that any error committed in this trial would be preserved on the record.

Finally, the court commented Barr's statement constituted "a great tactic. It is a great method for attempting to impugn the judge's fairness."

Specter of Retrial

Barr then raised the specter of having to retry the case should gross error be committed.

"Government counsel who have the responsibility only for the trial of this case – they won't have any responsibiilty for the appeal, they don't care what happens on the appeal – are leading the court into error and they are going about that, I believe, in a way which is necessarily going to result in reversal of any result in this case," he stated.

The suggestion that government counsel "didn't care" brought lead Department of Justice attorney Raymond M. Carlson to his feet as well. He stood a full five minutes before saying anything while Barr and Edelstein continued their discussion of potential error – by the court, by IBM, by the government.

Throughout, Barr continued to imply the court had shown favoritism toward the government by allowing unlimited direct examination of a witness and then limiting cross.

Carlson's comments did not help negate this impression. "I rose to address the court on one point," he said, "and that is that [IBM] counsel, in his long and involved statement, has impugned the integrity of government counsel. I resent it very much."

He added he was in the courtroom every day precisely because he does have responsibility for the appeal. "I am not here as an observer. Mr. Barr very well knows that."

Carlson backed down, however, when Barr stated the government attorney had told him on numerous occasions that " 'I have no responsibility for the appeal, that is not my hall park.' "

Commenting on the tone of the discussion toward its conclusion, Edelstein remarked, "the most discordant note about this entire colloquy is the fact that you and Mr. Carlson at the moment are somewhat displeased with each other and I just don't think that is necessary.

"You have worked too long, you have cooperated over a long period of time, and I just don't think this discordant note ought to be precipitated in this trial."

But this was not the first "discordant note" between the parties, nor is it likely to be the last. One long-term court observer has commented repeatedly he has never seen attorneys remain angry at each other once the judge leaves the room as they have in this trial.

Strike at Christmas Brings DP Nightmare

(Continued from Page 1)

be transmitted by Arinc were lost because "message queues got overfull."

Paul Luxion, a spokesman for Arinc in suburban Washington, D.C., said it was not an Arinc problem but rather one in which the airline industry's entire communications system was inundated.

Arinc, which normally carries about a million messages a day, was moving twice that number during the entire crisis period, which began on Dec. 9 with United's three-week cancellation of service.

This massive cancellation may have caused part of the problem, according to Glen Belden, United Air Line's president for computer and communications services based in Chicago.

"Normally during a strike we cancel flights for a three-day period and move that cancellation up one day at a time. This time, in the interest of the public, we decided to cancel all service for 15 days.

"Our reservations clerks, who are non-union employees, stayed on duty helping United passengers book flights on other carriers," he explained.

As an indication of the numbers of seats affected by the cancellation, United carries some 90,000 passengers per day, with 80% to 90% of the next 30 days' reservations on the books at all times, Belden said.

The cancellation generated a separate message for every name record in the reservations data base and, in cases where the space was sold by other carriers, that information had to be sent back to the carrier which originally booked the space.

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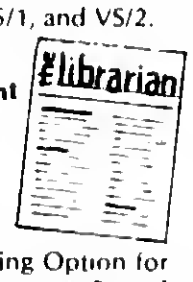
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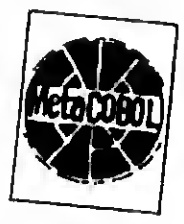
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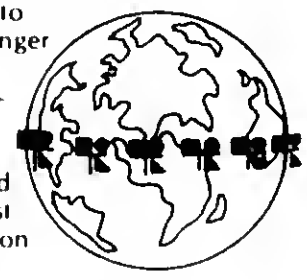


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Jury Brings In Verdict for User, Against IBM in '75

By Molly Upton
Of the CW Staff

PROVIDENCE, R.I. – What began a couple of years ago as an effort by IBM to collect unpaid bills for machine rental and systems engineering services developed into a jury verdict awarding the user $11.4 million and IBM its overdue payment of $68,453.

The turnaround resulted after a three-month trial of both IBM's case against Catamore Enterprises, Inc., a jewelry manufacturer here, and Catamore's counterclaim.

Catamore had charged IBM with breach of contract and warranty as well as with overselling, fraud and negligence.

The fraud charges pertained to the implications to the user of unbundling.

Attorneys for IBM have called the verdict "erroneous" and have asked Federal District Court Judge Raymond J. Pettine to overrule the jury verdict.

But Pettine upheld the jury verdict, and IBM intends to file with the First Circuit Court of Appeals.

While the case would seem to provide several precedents, it did not clearly establish fraud on the part of IBM.

The jury verdict merely established the amount of damages. It did not award punitive damages, possible only if the jury found IBM guilty of fraud.

What the case did establish is that an unhappy user can succeed in taking a vendor to court, charging the failure of his machine to perform as specified damaged his business both on an actual and on a projected basis.

The tale Catamore told in court was that of a naive first-time user told by an IBM salesman that a specific machine, a 360/20 BC-4 ordered in September 1968, would perform production control as well as inventory, order entry, invoicing, accounts receivable and accounts payable. IBM upgraded the order to a DO-5 in May 1969, Catamore said.

Catamore was later told it needed a 360/25 for the job, which was ordered in March 1970.

The jewelry maker contended it never received an operational production control system for which it had contracted and with which it intended to expand its business.

Catamore attorneys indicated the firm had been told unbundling would be a cost advantage to the user, whereas IBM management plans indicated the firm expected revenue gains from charging for services rendered.

The judge accepted as admissible evidence oral agreements between Catamore and IBM pertaining to systems engineering work because he ruled these agreements were separate and distinct from the written contracts for machine services.

IBM, represented by attorneys from the local firm of Edwards & Angell, fought this motion and decision constantly, arguing the oral agreements were covered by the written notices of changes in the bundling policy.

Review and Forecast

Privacy Still an Issue, But Hoopla Has Died

By Nancy French
Of the CW Staff

Last year at this time all eyes turned to Vail, Colo., where the vacationing President Gerald Ford was signing into law a number of eleventh hour bills, one of which was the Privacy Act of 1974.

That act guaranteed citizens for the first time that federal agencies would protect their personal information from access by unauthorized individuals and that "data subjects" would be allowed to access and correct their records upon request.

The law covered information practices in the private sector only to the extent that it provided for the establishment of a Privacy Protection Study Commission to review information handling in the private sector and recommend appropriate legislation to Congress for enactment in two years.

Although included in many earlier versions of the Privacy Act, law enforcement records were eliminated from protection by the new federal law.

Now, one year later, there is no hoopla and little publicity surrounding the privacy issue. Instead, there is only the sound of government bureaucrats grinding away to implement the law and make it work.

While Ford was criticized by many for being slow to appoint members to the Privacy Protection Study Commission, the commissioners were named in June, and that body went to work immediately.

Today, along with the seven commissioners, its offices are staffed by 17 officials whose responsibilities range from preparing issue papers for the commissioners and soliciting witnesses for hearings that will help determine how the commission spends the remaining 18 months of its life to typing letters and making travel reservations.

The Office of Management and Budget, which promised guidelines for implementing the Privacy Act early in the year, finally provided them in July, long after federal agencies had begun writing their own rules and regulations with only some preliminary notes and the act itself to guide them.

On Aug. 27, in the thickest issue ever published on a single day, the *Federal Register* carried all the agencies' rules and regulations together with a list of all existing systems of records.

The *Register* showed government agencies used 700 computer systems to process personal information.

States Start to Act

On the state side, Minnesota, the first state to pass a privacy law covering the information-handling practices of state and local government agencies, amended its law to ease the restrictions placed on local governments. The action was taken when officials and legislators realized such jurisdictions held no personal information and the requirement that they report all systems they had was an unnecessary burden.

The Minnesota Legislature also rede-

(Continued on Page 6)



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With Death of FS in '75

Predictions of Future IBM Offerings Remain Clouded

By E. Drake Lundell Jr.
Of the CW Staff

It's easy to predict that IBM will announce new products in 1976, but the old crystal ball gets decidedly cloudy when it comes to predicting what they might be.

In 1975 the firm killed the title of Future Systems (FS) even before it had graduated to the product stage – but just because the title was dropped does not mean the firm dropped its plans for a new line of equipment, predicted for 1976 in internal IBM documents released publicly in the Telex case.

Under the original plans as revealed in those documents, the FS was to be a completely new line of computers that would obsolete – but be compatible with – the 370 line.

The FS line was to have featured a new operating system, dubbed System Q internally, that would have had several features designed to make the systems easier to use by nonprogrammers and leading eventually to "programmerless systems."

These full-blown systems, as discussed in the Telex papers, would have been a significant advance over the present state of the art and would have been designed for a life of at least 15 years before replacement systems would have been introduced, rather than the present five- to six-year life cycle.

Question Changed

When IBM admitted it had dropped the FS designation, the firm emphasized product development was, of course, continuing.

So the question became: "Did IBM just drop the name – or did it drop the development of FS-like systems?"

And IBM's not telling.

It is clear several design efforts within the firm were halted around the time the FS designation was dropped, which would lead to the conclusion that development on that system was also dropped – right?

Well, maybe.

IBM, when it is working on new projects and systems, often has several parallel design and development efforts going at one time, often in complete isolation from each other. So possibly the projects that were dropped were only the ones with the least chance of payoff in the near future, or perhaps another design team had come up with a more cost-effective solution to the same problems.

Review and Forecast

So IBM could still be working on a revolutionary new system for introduction in 1976; certainly the firm's shipment figures and projections would seem to indicate a new system is needed to continue the firm's revenue and profit-growth picture during the coming year.

But there may be another solution to the problem of continuing growth and shipment levels. That would be the introduction of an interim or stepping-stone series of computers, either within the 370 designation or under another nomenclature.

Most industry pundits now expect IBM to opt for this approach – the introduction, during 1976, of a group of computer systems that gently extends the 370 line, but that does not depart as radically from the present state of the art as the FS series would have.

Under this scenario, the firm would use the new 1976 models as a bridge to the full FS-type system that would become available in the early 1980s.

The new systems, current thinking holds, would provide successor models to the upper end of the 370 line – possibly with the announcement of a 370/178 – and for the mid-range with 138 and 148 models.

These additions would be enough to ensure IBM remained on an upward curve in revenues and profits, the thinking goes, and would also enable IBM to get new machines in the marketplace without the necessity of having to complete work on its completely new series.

Of course, there are still many in the industry who expect the full blown FS system – possibly dubbed the 380 series – to be introduced next fall with features outlined in the Telex papers.

And then there is even a third group of IBM watchers who combine the positions of the other groups. These feel that IBM will essentially introduce just an upgrade to the 370 line, but that the firm will call it by a new name in order to assure users the line will not be just a bridge, but rather a good investment for the future.

Only the planners in IBM know for sure what will be coming out this year, and they're not talking.

Telex Case: Out of Court, But Not Out of Mind

By E. Drake Lundell Jr.
Of the CW Staff

After a three-year battle through the courts, the Telex vs. IBM antitrust case ended as most suits against the industry leader: with an out-of-court settlement.

The question for 1976 concerns the possible repercussions of that settlement on other peripheral manufacturers who had filed similar suits against IBM in the wake of the initial Telex victory in its action.

The 1975 action in the case was all downhill for Telex, which had won a stunning victory against IBM in 1974 when IBM was found guilty of monopolization for the first time ever in a federal district court.

But, from then on, Telex had nothing to crow about, since that decision was overturned by a federal appeals court while the IBM counterclaim charging Telex with theft of trade secrets was allowed to stand.

Then, late in the year, Telex blinked and decided it could not risk its corporate future on the chance of the Supreme Court hearing its case and ruling in its favor.

If that court had not heard the case or had ruled against Telex, the firm would have been forced into bankruptcy by the $18.5 million it would have owed IBM on the trade-secret charges.

With its withdrawal of the appeal to the Supreme Court, Telex was removed as a factor in the antitrust arena, and its case, along with its short-lived victory, became history.

Past Only a Prelude

But the past is prelude, according to philosophers, and in this instance, the history of the Telex case may have a bearing on the bost of other similar actions filed against IBM in the wake of the initial Telex victory.

At year end, all others in the arena emphasized their commitment to continue their cases against IBM and, if the present trial schedule holds, the cases will be heard starting next summer.

It is likely that the actions of California Computer Products, Inc. (Calcomp), Memorex Corp. and Sanders Associates, Inc. will go to trial, since all of them allege charges that are far broader than the ones in the Telex case.

However, the cases of such firms as Hudson General Corp. and Transamerica Corp. are fairly limited to the issues brought up in the Telex suit, and many observers feel that they will never go to trial, particularly if IBM is willing to offer some incentive to settle.

So, while 1975 saw the end of the first plug-compatible peripherals case against IBM, it could turn out that 1976 will see a renewal of antitrust action against the firm on similar charges.

And the 1976 action could well prove to be more definitive than the Telex case, which was cut off before a final resolution.

Hoopla Around Privacy Has Died

(Continued from Page 4)

fined the categories into which personal records were to be classified. To the categories of public information, which is open to all, and private information, which is open only to the data subject and public officials with a need to know, the state added a third: confidential information, to protect medical and psychiatric records which, if open to the data subject, may cause him damage.

Two other states – Utah and Arkansas – passed fair information practices laws, also limited to information handling by government agencies, and brought the number of states with such laws to three.

In California, where a similar measure passed both houses of the Legislature, a veto by Gov. Jerry Brown prevented its becoming law.

In Oregon, a bill covering privacy of criminal records was made law, but the ill-conceived measure was killed three days later because it went too far, legislators found out. Under the law, a wife couldn't even learn if her husband had been arrested.

So, looking back at 1975, much has been done in the area of privacy, but much remains to be done.

Perhaps a year from now, legislators will be aware of the issues involved in protecting individuals from abuses resulting from practices carried on in the private sector, and a new law will be in the wind.

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CW1210

DP in Education Continues Strong But Silent Growth

By John Hebert
Of the CW Staff

A strong but relatively silent demonstration of the existence and growing acceptance of computer capability in the field of education has clearly occurred during the past year.

The singular, most important event was the completion of a National Science Foundation-funded study of computing activities in secondary education known as Project Case and conducted by the American Institutes for Research (AIR).

The study repeated the first comprehensive survey of computing activities in secondary schools (completed by AIR in 1970) because of a lack of such information available "for the analysis of trends and estimates of future growth and directions," the report said.

The study supplied a wealth of information about the second frontier of educational computing and supplied insight into the first — higher education — which had exploited the potential advantages of computers long before public schools.

Use in Higher Education

Recent figures of computer usage in centers of higher education are not available. The last assessment was in 1970, and there were reports this year of renewed interest in the subject. However, no funding for such a massive undertaking has been appropriated.

In the university arena, computers were used in 3,000 to 5,000 U.S. college courses as of 1970, according to Martin Rubin, a research scientist at Human Resources Research Organization (Humrro).

The actual expenditure for university computing through 1971 was about $500 million, Rubin said. Hardware expenditures alone through 1980 will be around $1 billion, he estimated.

The study of secondary schools represented an accurate barometer by which to gauge the climate and atmosphere of educational computing and, in the process, qualified a report in *Computerworld* on the significance of the decrease in federal funding for computer-aided instruction in recent years [CW, June 4].

The cost of instructional computing at any level of education has been a thorn in the side of educators wishing to utilize the capabilities of computer technology.

And a decrease in federal funding may appear to cast an unwelcome shadow on an otherwise hopeful future.

However, local and combined local and state sources of funding were responsible for 84.9% of instructional computing activities found in the U.S. secondary schools surveyed, with local funding taking the brunt of support at 63.3%, the AIR study found.

Another hopeful comment on the problem of costs cited by the AIR study was that the cost of computing has decreased in the past four years.

Directly related to the Project Case results was a report on the current status of the Minnesota Educational Computer Consortium (Mecc) at the Association for Educational Data Systems convention this year.

Mecc was created by five Minnesota state agencies in 1974 to equalize instructional computing capabilities at all levels of education on a statewide basis, according to Dr. Kenneth E. Brumbaugh, state instructional coordinator of Mecc.

Mecc is a highly organized body with policy direction and goals defined by the users.

Review and Forecast

This cooperative effort promotes sharing of personnel, library materials, computing equipment, time and, especially, purchasing of the equipment.

Using a statewide purchasing agreement, for example, Mecc is assisting schools with the purchase and maintenance of equipment, thereby effectively holding the line on costs.

Mecc seems to be an efficient and formidable method of providing instructional computing while overcoming prohibitively high costs and other problems.

It is also another solid demonstration of the growing use and acceptance of instructional computing.

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Larry Constantine—co-author of "Structured Design" in the IBM Systems Journal and co-author of Structured Design. Larry will speak on structured design and its impact on structured programming.

Bill Plauger—co-author with Brian Kernighan of The Elements of Programming Style, "Programming Style" "Examples and Counter-Examples" from the ACM Computing Surveys special issue on programming, and the soon to be published Software Tools. Bill will speak on programming style and will emphasize that eliminating GOTO statements does not ensure a readable program.

Tom Plum—co-author of "IF-THEN-ELSE Considered Harmful, "Teaching Structured Programming...by Example," and "Remedial Programming." Tom will serve primarily as moderator.

Ed Yourdon—author of Design of On-Line Computer Systems, Techniques of Program Structure and Design, and co-author of Structured Design. Ed will discuss the practical problems of implementing structured programming and the associated "programmer productivity techniques" in the typical EDP organization.

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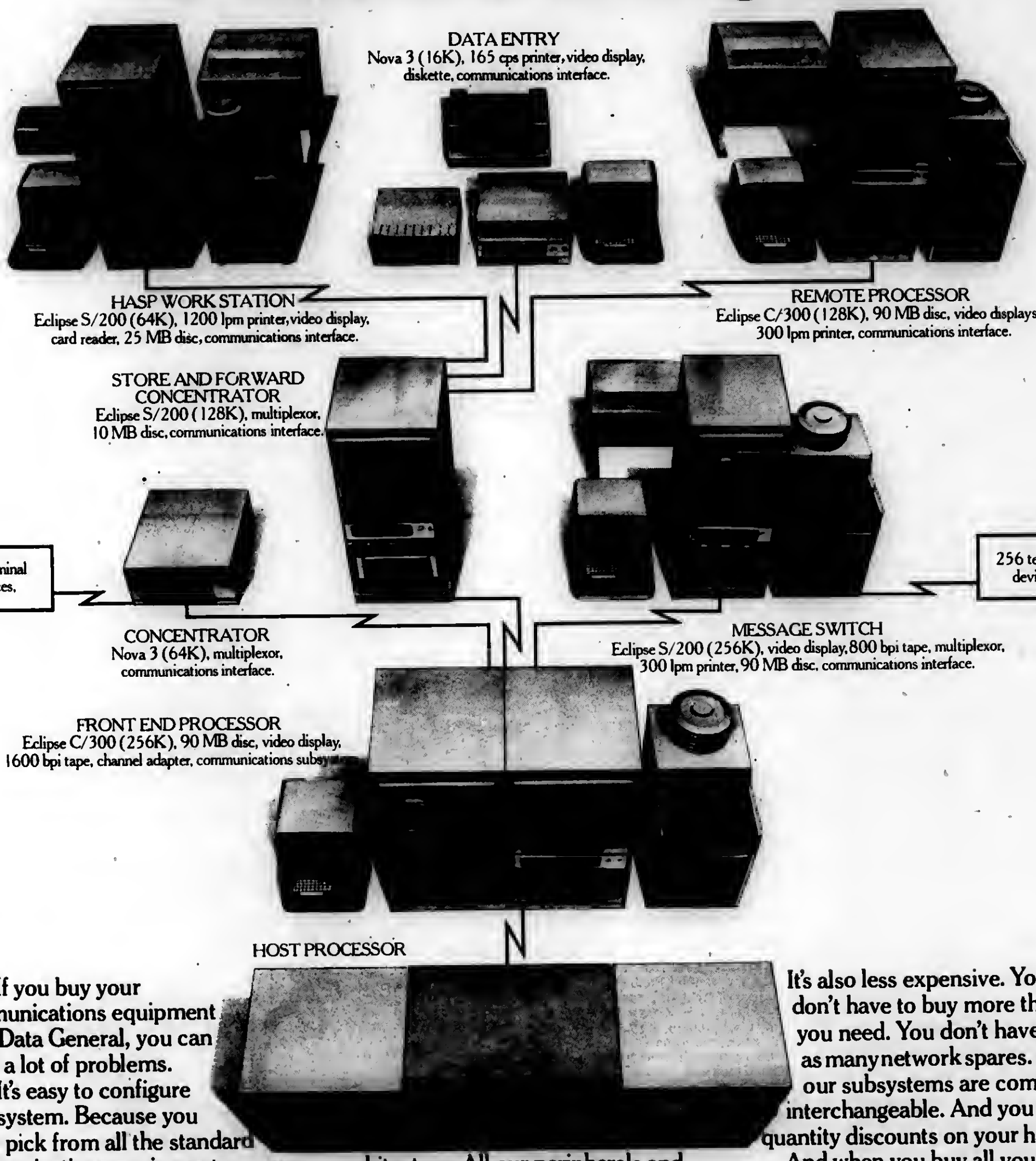
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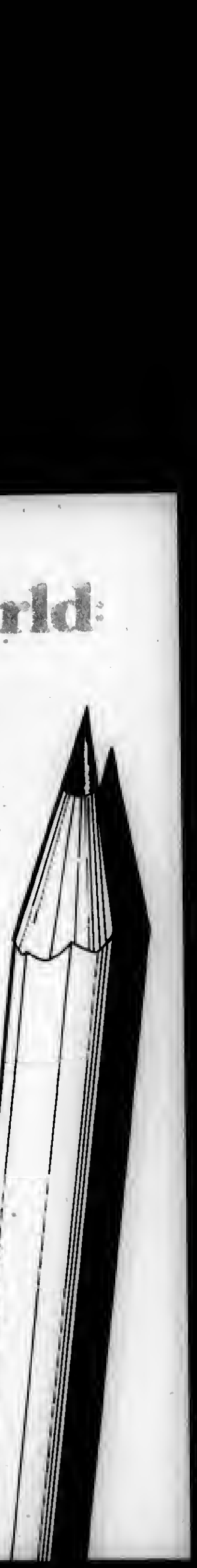
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- ☐ DEMANDING
- ☐ FURIOUS
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COMPUTERWORLD

SCDP Licensing Proposal Splits DP Community in 1975

By Catherine Arnst
Of the CW Staff

Licensing, certification and professionalism were issues that polarized the DP community in 1975 after the Society of Certified Data Processors (SCDP) proposed DPers be licensed to practice.

One supporter of the measure thought it would bring computer personnel "recognition as professionals."

A detractor protested it would only result in "a license to steal."

SCDP sent a draft of legislation to all state legislatures in December 1974 that would declare data processing "a learned profession to be practiced and regulated as such."

The proposed legislation would have set up state boards of registration to rule on who could "practice data processing" and would have required DP centers to have a "registered professional data processor" on the staff with the "leverage" to grant or withhold approval of applications and systems.

The proposal brought cries of outrage from most segments of the DP community (in a *Computerworld* reader survey, 72% of the respondents voted against licensing and 15% supported it [CW, April 2]).

Legislation was introduced in three states and there was enough attention to motivate most major conferences this year to include a session on professionalism in their programs.

SCDP Not Displeased

Now, one year later, not one state has passed legislation instituting licensing, but the SCDP still considers its proposal a success, according to Kenniston W. Lord Jr., president of the organization.

"We have accomplished what we set out to accomplish," which was to draw attention to the need for a national set of standards directed toward the performance of DP people rather than systems, he said.

"Licensing was never the issue," he stressed. "Professionalism is the issue.

"Our concern is that the industry take some action on what affects people's health, welfare and well-being. We were not able to get any movement on our concerns before," Lord said.

A Quiet Death

Licensing itself appears to have died a quiet death after a noisy and what many considered a premature emergence onto the DP scene.

New Hampshire, Massachusetts and Florida were the only states to take action on the SCDP's proposal. The New Hampshire Legislature has referred the bill to committee until it meets again in January 1977 [CW, May 21]; Massachusetts killed the proposed bill in March [CW, April 9]; and Florida's bill, which only requires voluntary registration of Certificate in Data Processing (CDP) holders, is awaiting action by that state's Legislature when it reconvenes this month [CW, May 7].

A proposal for a voluntary state certification drafted by two members of the New York State chapter of the Data Processing Management Association is still being worked on, according to one of its developers, after an initial April meeting to discuss the proposal.

"Everybody is really on the fence on the issue," Fran Gawronski, a coauthor of the proposal, said. The proposal requires a great deal of thought and changes are being made continuously, he said, adding it will be discussed again at a meeting in March.

One accomplishment of the SCDP's licensing proposal, Lord said, is that it has "done a great deal to draw attention to the Certificate in Data Processing," which is awarded after successful completion of the CDP exam.

More Apply for CDP

His claim was backed up by the Institute for the Certification of Computer Professionals' (ICCP) announcement that requests for applications for the next CDP exam, which the ICCP administers, have reached 20,000, double last year's number.

And the ICCP has started a planning workshop to decide the structure of future exams, according to Martin Morris, who sits on the boards of both the ICCP and the Association of Computer Programmers and Analysts (Acpa).

Review and Forecast

The Acpa is one of the more vocal opponents of the SCDP's licensing proposal, although it does support voluntary certification. But "to gain credibility, ICCP has to come out with more than just the CDP exam," Morris said.

The institute is now working on revitalizing the Registered Business Program (RBP), which died because it was never promoted properly, he said. The RBP will test Cobol programmers' knowledge and should be offered by November 1976, he said.

Morris hopes the ICCP will begin to establish a series of exams for certain types of industries similar to those used by the insurance industry. Under this plan, the CDP holder would progress through a set of increasingly specialized exams concerning his field of work.

The Acpa, meanwhile, has moved for a uniform code of information processing similar to that developed by the British Computer Society, Morris said.

Development of this code "must come under the auspices of an umbrella group such as the ICCP, which has eight charter groups as members," because no one of the individual societies would be able to enforce a code on its own, he suggested.

Morris does not see these changes going into effect for five years and admitted "the move toward licensing may be progressing faster than this.

"I'm afraid some budding young legislator may sneak a licensing bill through," he said. "It depends on how much fraud there is in that particular state."

The Acpa is developing a legislative action subcommittee to pick up on any new legislation, but Morris suspects there won't be much action in the first half of 1976.

"The legislators say they don't want a damn thing to do with it" until an adequate testing and training base can be developed, he said.

No Push in '76

Lord agreed with many of his opponents that "it is too early for licensing" and does not intend to put the SCDP's energies into pushing the licensing proposal in 1976.

His broader goal is to establish a uniform code of standards to protect the public from abuses, accidental or planned, by DP personnel that effect the health and well-being of the public.

"We must stop dealing with the sensational aspects of licensing and instead deal with the issues it raises," he insisted.

It doesn't have to take five years to develop a code of standards, according to Lord. "If I had five organizations and $100,000, we could have a code developed in a year," he said.

Din of Dissension Marks UPC Attempts As Whirr of POS Goes Unnoticed

By Toni Wiseman
Of the CW Staff

While the whirr of point-of-sale (POS) terminals in department stores goes unnoticed by most shoppers, the blip of Universal Product Code (UPC) scanners in supermarkets is being drowned out by the din of dissident consumers, legislators and labor unions.

The controversy, touched off by removal of individual item prices, centers mainly around the consumer's "right to know" and in the last year has been the basis of dozens of state, municipal and federal bills attempting to make price marking mandatory.

A strong force behind this legislation has been labor unions, which fear workers will be displaced by the scanners.

The battle between legislators/consumers and merchants/manufacturers has been a virtual draw so far – some bills passed, some rescinded and some defeated. Some remain in limbo.

To date, only four states have price-marking laws on their books: California, Connecticut, Massachusetts and Rhode Island.

The Massachusetts law is one of long standing and was not prompted by the appearance of UPC scanners. Connecticut and Rhode Island passed laws mainly because of labor efforts, according to a spokesman for the National Association of Food Chains. In fact, no store in either of these states is using scanning equipment, let alone removing prices, he said.

In California, where scanning equipment has been installed, a price-marking law will go into effect in April 1976 and run only until April of 1977.

In addition to state laws, a few cities considered laws. Chicago, for instance, passed a strong ordinance by a vote of 45-1. A similar measure was killed on the Illinois Senate floor for a lack of seven votes.

In all, 30 states introduced pricing legislation this year, but – with the exception of Connecticut, Rhode Island and California – the bills, including federal ones introduced by Sen. Frank Moss (D-Utah) and Rep. Harold Ford (D-Tenn.), remain in committe.

Three Conducting Tests

Some 40 stores throughout the U.S. have scanning equipment installed. Of these, only three conventional supermarkets – Lucky Stores in San Leandro, Calif., Marsh Supermarket in Troy, Ohio, and Giant Supermarket in Severnia Park, Md. – are actually conducting scanning tests without prices.

In addition, three warehouse distribution stores are testing with individual prices removed (warehouses do not normally price individual items).

On the basis of these figures – six out of 40 – it is hard to even suggest there is a trend away from traditional pricing.

NCR conducted a consumer study on scanning at its Marsh store installation. The study showed only 35% of the customers found their shopping pattern changed as a result of the removal of individual price marks.

Asked how they felt about eliminating item pricing if the store could demonstrate tangible price savings for the customer because of not having to mark the individual items, 27% said no pricing would be OK with any savings, 32% said it would be OK with some savings and 16% said it would be OK only with big savings, while 25% said they wanted individual item pricing under any circumstance.

The customers were split fairly evenly (54%-46%) when asked whether they wanted price marks to be put back on individual items at the end of the test or whether they could get along without them.

Comparison shopping has been one issue hotly debated. Consumers have said they cannot be sure the price they are charged at the checkout is the same as was on the shelf. Or, if there is a sale item stacked at the end of an aisle, they can't remember the other brands' prices.

Manufacturers have countered with the argument that comparison shopping will actually be easier with the new systems since, depending on individual store policies, the shelf labels will include unit-pricing information along with item prices.

Price comparisons either made at home or at other supermarkets, they contend, will also be feasible since the customer receipt includes a word description of each item. This enables the shopper to compare prices with earlier receipts.

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31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other

Statistics Show Sex Bias Plagues DP

By Catherine Arnst
Of the CW Staff

Even though a majority of women in a recent survey (CW, July 23) reported encountering little discrimination in the DP field, a new statistical survey shows that in fact sex discrimination is pervasive and widespread.

Women in DP "are not receiving equal pay for equal work and may not be sharing equally in opportunities for advancement," according to a recent study published in *Communications of the ACM*.

...n in the computer user indu...
...% of all keypunch operato...
20% of the computer ...
...grammers and 13% ...
...ts, the study fou...
...n constitute ...
in the co...
chers,

Secret Service Files Prove 'Squeaky Clean'

By a CW Staff Writer

WASHINGTON, D.C. – Although the U.S. Secret Service maintains a computerized file on about 50,000 people considered potentially dangerous to the President, Lynette (Squeaky) Fromme wasn't in it.

Fromme, arrested two weeks ago ... an alleged assassination ... against President Ford, ... under Secret Service surveil... cording to a White House spo... Secret Service spokesmen, howe... fused to confirm this.

Fromme is a follower of ... Manson, who was convicted f... ...rder of actress Sharon Tate ... ...ns in August 1969.

...me is reputed to have ... ...s her arm," ...itions

Secret Service officials ... Congress, in open comm... about the existen... ized file on ... dangerou...

Th...

IBM Trial Begins This Week

By E. Drake Lundell Jr.
Of the CW Staff

...YORK – After six years and 122 ...U.S. government's massive anti... ...st IBM is slated to begin ...), barring last minute ... the case and ...eed they ... a trial

...does claim some of them are and, in ...case, show IBM has monopoliz... ...market and intends to promote ... ...tain that monopoly.

Claiming IBM has mor... ...systems market and the ... ...ment said it plans ... ...nance in a numbe... ...

First, the gov... Telex case ... heavily on ... definition, ... any antitrust ... It is this p... ...dcter...

Licensing 'Oppressive': Glas...

Last w... Judge Davi... were ready to st... ...thout further delay.

...he case, the governm... ...monopolizing the gene... ...puter market through a series ... ...es designed to maintain a high share ...he market and to keep competition at a ...minimum.

In the trial, which is expected to last as ...ng as a year with a one- to two-month ...ess this summer, the government hopes ...prove IBM has shown a pattern of ...conduct and actions intended to monopo... ...lize the computer business.

On the other side, IBM claims it is ...

...ment that attache... ...while IBM argued t... ...should be consi... ...for all ... used ... "pl...

Army Surveillance Data Turns Up Two Years After Its 'Destruction'

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Surveillance data on civilians and civilian organizations gathered by the U.S. Army prior to ... and ordered destroyed by ... of Defense (DOD) ... destroyed ...

specific permission. The recent anno... tradicts ...

Brings Group to Full Strength

Ford Names Four to Privacy Commission

By Nancy French
Of the ...

WASHINGTON, ...
...ist week announc... ...ointments to t... ...tudy Commission, created ... ...icy Act of 1974. His announcement ...ought the commission to seven mem... ...ers, its full authorized strength.

The new members are William O. Bailey ... West Hartford, Conn., executive vice-...esident of Aetna Life and Casualty Co.; ...vid F. Linowes of Scarsdale, N.Y., a ...rtified public accountant and partner in ... New York firm of Laventhol, Krek... ...in, Horwath and Horwath; and ... Ware of Santa Monica, Ca... ... of the Rand Corp' ...rch Staff.

...e will ... ...N.Y.'

and managing editor of the *Philadelphia Bulletin*.

Koch and Goldwater were appointed by ... ...f the House of Representatives ... ...son and Tennes... ...

president of the ... Linowes, a Democrat. ...scribed as "a busines... ...issues" and is t... ...rate Conse... ...vival: ... C...

...cial ...o-

rator of the Hartford Hospital.

Koch told *Computerworld* ...pleased the private sector ... ...ernments are represented o... ...sion.

"I intend, as I hope the othe... ... hearings regardi... ...ith ...

Jr. and I have ... purpose of eliciting comments ... set in cement. Undoubtedly there mus... be additions, deletions and changes.

"That is why the privacy commission ...ame into being – to provide a forum for ...at testimony," he said.

Private Sector Awareness

...spokesman for Goldwat... ...ssman is very h...

Xerox Departs Main...

By E. Drake Lundell Jr.
Of the CW Staff

SEGUNDO, Calif. – "A sort of numbness" has settled ... people at what used to be the headquarters of ...'s Data Systems Division here. ...'stand the idea that we're out of business on ...evel," one said last week, "but psycho... ... in yet."

this is a period of rapid activi... ...and inertia for the people h... ...er come before their pink ...

...g contacts on the ...g up the switchbo... employers outside ...

One m...

Whining Terminals' Case Mystifies Ohio University

By Nancy French
Of the CW Staff

Ohio – When Ohio State ... installed 16 new CRT ...ecember, library of... problems were ...ines literally ...ey solved. ...ed by ...ph

And the Asciscopes seemed quite satisfactory in 10 other library locations, where background noise generated by conversation and other people traffic masked the whine.

"In the close confines of the telephone center, however, where the noise level was almost zero and where the terminal operators sat at the CRTs for long periods of time, the combination was deadly," Notestine said.

Cooperative Vendor

... with closing down the library's ...service center, replacing the ...t employees with hard-of... ... getting rid of the two... Notestine consulted ...nd was told that, ... the terminals, ...tally bind... ... to ...

GAO Probing $403 Million SSI Errors

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Problems with ...puterized payment system designed ...checks to recipients who qualify for ...plemental Security Income (SSI) prog... ...been blamed for more than $403 ... overpayments over the past 18 month...

This Social Security Administrat... program, which by June 30 ... $8,075,277,809 in both state and fe... is now being scrutinized by the ... counting Office (GAO) at the req... Birch M. Bayh (D-Ind.). Finding... next month.

Bayh said he ... "prob...

Business Booming at State Unemployment DP Centers

...logica...
At the ...
followed b...
who hope repu...
...ive. ...ander aro...

Whining Terminals' Case Mystifies Ohio University

...ig ...on a ...system. It ...of its type in ...pitz said, and the ... Date-a-Dog has been ...menal."

...he attraction of such a selective system is to "upbreed a dog; to breed out any genetic defects," Spitz said. A large number of show dogs are listed in ... system, she said. ...good adva...

DP for the Dogs

No 'Love Matches' Allowed for Canines

By Catherine Arnst
Of the CW Staff

MOUNT PROSPECT, Ill. – The perfect match is not made in heaven as far as selective dog owners are concerned; a computer service does the job for some canines here.

Date-a-Dog was started in May ... as a computer-assisted matin... service for canines. The u... ...ervice is the brainstorm ...on Spitz, owner of ... ...ogs, a pet and ... e had bee... ...ds (...

400 studs ... ...o take part in ... owner pays $10 ... out a computer card ...

listing 14 items about his dog ... including age, breed, defect... attributes.

When a female is ... two weeks out ... computer i... of eligi... from...

Technology, McDonald's Collide As Students Best Burger Bonanza

...r the use of ... ...ome ... ...y're ... their ... ...r childre...

Proble...

"There are a lo... problems we hadn't ... when we decided to ... ize," she continued. "... were doing it ourselves, w... all the dogs. Now, people ... always fill out their cards ha... estly. Everyone thinks ... perfect and do...

Commerce OKs Large IBM Shipment to Terrori...

WASHINGTON, D.C. – The Commerce Department has given IBM "verbal" approval for the shipment of 10 System/7s, 370/158 and related equipment and ... terminals to the Soviet Union – one of ... the largest Eastern Bloc computer ... ever to receive U.S. clearance. The systems would be used at th... River auto and truck manu... ..., now under construction ... and expected to be ... ...t on completion ... for produc...

...tems now goes to the Nato Coordinat... Committee, which must rule on all ... applications. Industry sources said, ...ever, that in the past the ... generally has acted as a "rubbe... for applications which have cl... ...pproving the sa... ...merce Department. ...me as ...

...head with any ... ...becaus...

CHICAGO – O... among the nine ... corporate offices ...enced nearly sim... bomb explosions ... and Washington, ... As in all of ...

But Nature of Industry Cha...

DP Sales Seen To...

By Catherine Arnst
Of the CW Staff

HOT SPRINGS, Va. – With revenues ... billion this year, the ...

"The ... will co... classica... ory, so... and o...

32,000 Converge on Anaheim NCC

By Ronald A. Frank
Of the CW Staff

... – There was no recession ... than 32,000 converged ... Center for the ... with a ...

IBM Cleared of Telex Case Monopoly Charges

Lower Court Overturned

DENVER – In a wide-ranging ruling absolving IBM from monopoly charges, the Tenth Circuit Court of Appeals here has ... man appeals court ...

IBM Plans Appeal

Catamore Wins $11.4 Million

By Molly Upton
CW Staff

R.I. – After ... deliberation ... IBM ... the counterclaim and we are going to appeal," Frank T. Cary, IBM chairman, said.

Judge Raymond J. Pettine commended the all-male jury for its work, noting this was one of the longest jury cases he had ... 's lead attorney, ...hristo, said he ... a "major ...r field ...d

Co., known as Clements Autc $480,811.33 in damages. Cl ments alleged SBC misrep sented the capabilities of an ventory control reporting s tem.

'Almost a Classic Case'

Christo called the Cata case "almost a classic case first-time user right down t very naive way that firs users look at things."

In the case, IBM sued ..., a jewelry manuf ...payment and C ...ed, charging b ..., breach of ... nd negligence [(

...amore's final clai ...sought $26 millio ... countersuit incl ...ust charges, but t ...separated.

Catamore, a firs with no DP experi sonnel familiar with that IBM offered a production control which Catamore p pand its business.

Catamore signe ...vices agreeme ...reed orall ...ineer

Judge Defined Market Wrong

By E. Drake Lundell Jr.
Of the CW Staff

... – The key to th ... of Appeals' rev ...gment against I ...es in the area ...horny but critic ...se.

...ntitrust ...ries of t ... the siz ...

...claimed ... for pr ... to

Judge Orders DP-Aided Desegregation

Tactics Ruled Not Predatory

By E. Drake Lundell Jr.
Of the CW Staff

DENVER – The IBM actions in the pe... was ...pply ...

...rame Scene

...ith Holmes
...CW Staff

... Texas – A U.S. Dis... has ruled a computer ...elp desegregate this city's ...ools with a minimum of bus...

...edicting it will be at least three ... number.

... had been no hint of the decision ... continue operations at all, with the ...ral information being that only four ... West Coast knew of the ...cement up to a week ...lly.

...matter of school desegregation ...ds of the school district, Judge ... appointed a committee of ...cientists and three lay ad... ...te plans that could be

...ber, Dr. Joseph Rupp, ...miner and an officer ... called Concerned ... C. Peter ...ested the court ...opping the plan.

...ment found out ... managers held

Rupp made his suggestio...

has been working on million-dollar plans to desegregate its elementary schools for the last four years, the court-appointed committee has devised plans that should cost no more than $100,000 in five ... and with a minimum of busing.

"Children may have to walk a ... but the neigbborhood school c... be destroyed as it would b... busing," Rupp said.

All of the plans submitted t... have this characteristic, and ... decide on a particular solutio... implementation by the oper... the end of August, he added.

Amdahl Ends Silent Years With Unveiling of 470V/6

By Patrick Ward
Of the CW Staff

SUNNYVALE, Calif. – Amdahl Corp. ...oduced a general-purpose computer ... it described as software- and hard-...compatible with the IBM 370/168, ...out 100% faster.

... addition, the firm announced two ... of lease financing for the system, ...ed the 470V/6.

...rmal unveiling of the 470V/... ...the first product announc... ...firm that Gene M... ...M Fellow and m... ...the Syste...

...than the small-scale integration circuitry ... found on a 370/168.

The higher LSI packing density ... 100 circuit/chip vs. 5 circuit/... 168) cuts wire travel time ... principal reason why ... 32.5 nsec cycle ... 168's 80 ns... said.

End Comes for Telex vs. IBM

TULSA, Okla. – Faced with the choice of rags or riches, Telex blinked and negotiated a settlement of its antitrust suit against IBM just 72 hours before the Supreme Court was to hand down its decision on whether it would hear the case.

The settlement called for no payments of any kind between the parties. IBM released Telex from an obligation to pay $18.5 million as the result of IBM's countersuit on trade-secret charges, and Telex agreed not to pursue its antitrust claims.

The negotiations leading to the ...tlement were initiated ... weeks before ... the ...

in the three days before the pact was initialed.

The suit was settled with prejudice, which bars Telex from ever bringing the charges again, ending one of the most dramatic private antitrust cases of the past 50 years.

The case resulted in IBM being handed its first antitrust defeat of the computer era, but IBM's persistent pursuit of its case won it a stu... reversal on appeal.

The mov...

Personalized DP Diets Wage Battle of the Bulge

By Catherine Arnst
...he CW Staff

Computers have been used for some time in aiding menu and diet planning at hospitals, but a few commercial companies have taken the practice a step further by marketing computerized diets for the general public. The idea is to help the weight-conscious consumer slim down with his own personalized diet.

Two companies in this market are Nutritional Diet, Inc. of New York City and Time Pattern R... of New Jersey. B...

...omputer program... ...menu spe... ...erson's ... fed into ... med to ... cifical' ... need...

The diet is both weight reducing and fully nutritional, he claimed, and he feels its attraction is that a dieter eats only foods he likes, ...d the meals are full enough so ...er won't feel hungry.

...Make Money'

...t with a ... a

through mail or direct mail, is available nationwide and costs $6.95.

Green said the diet has been successful and, although it may seem faddish, he personally would attest to its value. "I lost 50 pounds over 3-1/2 months, and a number of my friends lost almost as much."

The Cadence Computerized ... marketed by Time Pattern ...is similar to Nutritional ...designed by Dr. ...tor of the ...ic at

With Cash-Flow System

...Russia

...ch arrangements, pri... e more famous ...f concern that there o shed pounds by ...ive reaction from con- American adults ... such as the Young than 20% over... ... in the U.S., some $12 billion was ...nt in this country on goods ...signed to wage

DP Helps Juggle N.Y. Debts

By Don Leavitt
Of the CW Staff

NEW YORK – As late as mid-summer, this city's financially beleaguered administration ... unable to tell the M... ... sistance C...

years ahead, she said last w... MAC is the New York ... based sponsored organ... sponsible for floati... the city to help ... The question ... was "pe... Detowt... no ... r...

...sts Claim Responsibility for IBM Bombing

...ne IBM Plaza here was ... government buildings, ... and banks that experi... ...ultaneous early-morning ... last week in New York ... D.C. as well as Chicago ...

viewed the bombings as part of a "coordinated attack against Yanki government and monopoly capitalist institutions."

By the middle of last week, Chica... police reported they ha...

gress in the case. Bomb experts believe the devices used here contained dynamite and were ignited by small propane ... ..., a method used previously ... ...politan area by the FAL... ..., is able to r... ...for not ji...

...all figure ...ds were ...es of ...ions ...i-

...pping $25 Billion in '75

Equipment Stays Behind

DPers Last to Leave 'Nam

By Edith Holmes
Of the CW Staff

...ng – these are ... more famous ... than 20% over...

...architecture of computer systems ...ntinue to move away from the ...l combination of processor, mem... ...control circuitry and an input ...t module. The computer will ... ...ork oriented around a vast

...will be looking for alternate ... ...paths and manufacturers will offer ... IBM is already shifting its emp... away from rental, he added. The 51 ... for example, is a purchase-only machi... "It's becoming clear IBM's Gener... Systems Division represents a new voic... ...mputer industry that we had ... "Perhaps

Employed by the California-based Computer Sciences Corp. (CSC), the two members of the CSC team of 12 in Saigon closed their advisory office to the Government of Vietnam (GVN) Computer Center when other nonevacuation-oriented U.S. operations terminated on Monday, ...man for the company ... left" with the ...ountry the

aid South Vietnam last Decem... ber when the Southeast Asia ... Computer Associates (Seaca) in ... Honolulu lost its contract of sev... eral years in a bidding pro... cedure.

Equipment Intact

"At the time our contract, and thus our involvement, ended, all of the equipment was intact and the Vietnamese had assumed most of the operational and managerial functions," Norman Rezendes of Seaca said. Locate... in the prime minister's offi... ...GVN Computer Center ...d an IBM 360/5... ...24 hour/day

Another Year Proves 'Computers Don't Err—People Do'

By Catherine Arnst
Of the CW Staff

It's a cardinal rule at *Computerworld*: "Computers don't make errors – people do."

Nevertheless, it is often easier to blame some unreasonable foul-up emanating from the DP department on the unreasonable machine that processes all the data, rather than on the human who input it.

An executive at an Oregon bank summed up the situation when he blamed an error at his bank on a bug in the computer system. "That's only what we tell the public," he said.

"Isn't it funny how we'd rather blame the computer than human error? The customer accepts that a lot easier," he observed.

But passing the buck to a machine doesn't always work; the public realizes that someone is running those machines – and probably making some mistakes while he's at it.

Constant reporting of these mistakes, however, led one reader to complain that "the general public has now begun to regard DPers as a blundering group of professionals who make life miserable for everyone."

He suggested errors be reported "in a proper perspective" – as exceptions. "The public should be educated," he said, and that education must emphasize "that our techniques are good, our errors are small and, above all, that we are human."

But errors are not always small, and a mistake involving a critical piece of data can cause more damage than that done to the social life of the DP staff required to work overtime to correct it.

Spectacular Errors

The more spectacular errors of 1975 concerned welfare payments, which generally involve that segment of the population least able to afford any foul-ups.

In New York, improperly coded Medicare claim forms caused as much as $12.7 million in medical bills to go unreimbursed last year, a study by the General Accounting Office (GAO) reported [CW, Aug. 20].

According to the report, 65% of the patients sampled who had filed claims for surgical procedures were paid less than they had expected, and as many as 13 of the claims processed contained coding and data entry errors. The GAO attributed the underpayments to coding errors, lump coding and inaccurately skewed fee schedules.

Although data entry personnel who enter the information into the Medicare system can catch the most obvious errors through a built-in edit program, many go undetected at this stage of claims processing because of simple keystroke errors, a spokesman for the Social Security Administration's (SSA) Bureau of Health Insurance added.

In August, a programming error in Maryland resulted in $10 million in overpayments to about 15,000 people all over the country covered by Supplemental Security Income (SSI) [CW, Sept. 3]. This brought overpayment under the new federal welfare program to over $403 million in its first 18 months of operation and caused President Ford to ask the Office of Management and Budget to review the matter.

The Washington Star reported that when Congress was considering SSI, congressmen were assured the SSA's computer operation, its years of DP experience and its reputation for being among the most efficiently run federal agencies would make the system work from the word "go."

But it seems that someone told the agency not to pass "go" and not to collect $200, much less $403 million.

In Washington and Florida, the state Social Security Departments went the opposite direction: rather than take the chance of overpaying, two living recipients were declared dead and payments were stopped altogether [CW, June 25]. Both women have since been resurrected.

Unemployment centers faced with soaring unemployment rates were also the source of DP errors this year. Both Arizona and Colorado experienced problems

Review and Forecast

with overburdended systems and inexperienced employees hired to handle the rapid rise in claims [CW, May 7]. Approximately 12,000 people were kept waiting for their checks in Arizona and 200 were held up in Colorado.

And, of course, there were the billing errors, those Kafkaesque nightmares that everyone or his neighbor seems to get embroiled in at some point. Tales of unending correspondence with unfeeling computers have filled the pages of *Readers Digest* for years.

One example occurred in Tennessee when two seperate lawsuits for $100,000 were filed against the J.C. Penney Co. because of billing errors [CW, April 9].

Robert C. Moorhead charged the store with "outrageous conduct" for its repeated billing of $16.78 when the amount should have been a credit. After a year and four months of trying to correct the error (during which time even the store admitted the error, opened a new account for him and carried over the old charge, Moorhead decided to sue.

William Smith was billed by the store for charges made on someone else's account, in spite of the fact that the account numbers were different. It only took him a month to file suit.

Consumers are protected from this kind of harrassment by the Fair Credit Billing Act, which went into effect Oct. 28. Now, a creditor must acknowledge a written inquiry from a customer concerning computer-generated overdue notices within 30 days and resolve the dispute within 90 days.

Help for Taxpayers

Taxpayers may have the same kind of protection from the Internal Revenue Service (IRS) in the future, mainly because the person that agency chose to dun for 18 cents interest on an amount he already paid – twice – was Rep. Clarence Long (D-Md.), who sits on the House committee which appropriates funds for the operations [CW, Nov. 12].

Long is drafting a bill, the Taxpayer's Bill of Rights, to prevent taxpayers from being plagued by the IRS any more than they already are.

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Surveys' Conclusions Differ

Sexism in DP Industry a Controversial Issue in '75

By Catherine Arnst
Of the CW Staff

"I hope in 10 years from now I'm not even asked about women in computing," Jean Sammet, president of the Association for Computing Machinery (ACM), said in November of 1974.

In 10 years her wish may come true, but in 1975 the attitudes of and about women working in DP became one of the more controversial issues in *Computerworld's* pages.

During a four-month period, five articles, three editorials, one reader commentary and 29 letters to the editor were written on the subject.

All attempted to either prove or dispel the idea that sexism exists in the industry.

Opinions ranged from a description of "the overall picture of the industry as a disgrace" by Judith Lightfoot, an officer of the National Organization for Women, to the cynical letter claiming: "There is a much simpler solution to the problem of the underpaid female in DP: less brain, less pay."

Different Versions of Truth

Three different surveys came up with their own versions of the "truth." CW's sampling of 30 women chosen from Computer Caravan attendees revealed 18 of that group did not feel they had been subjected to sexual discrimination.

However, six added, this was primarily because their individual companies were good in this respect, and others said they may yet encounter problems when they try to advance into management.

There was a definite split between women with a number of years of work experience and those who only recently entered DP.

Eighteen of the 30 had been in the industry over four years; nine of these claimed they had met discrimination. Of the 12 who had worked less than four years, only three felt they had encountered discrimination.

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In *Datamation's* August issue, a survey of 327 women came up with similar results: two-thirds of the respondents felt they had equal status with their colleagues in pay, promotions and overall.

Seventy percent felt they had opportunities for advancement to a senior level, but only slightly over half thought there were opportunities for women to hold highly responsible management positions.

And, once again, "the 'yes' answer to management opportunities came preponderantly from the youngest age group," the authors said.

These two surveys measured attitudes; a study of the facts came up with opposite conclusions.

An article in the July issue of *Communications of the ACM* said "women in DP are not receiving equal pay for equal work and may not be sharing equally in the opportunities for advancement."

Using statistics culled from the U.S. Census Bureau, the Department of Labor's Standard Industrial Classification employment data and the Bureau of Labor Statistics' Area Wage Survey, the authors found women constitute only 20% of the overall work force in the computer users area in contrast to 39% of the national labor force; women tend to be employed in jobs with lower requirements; and within each occupation, women are paid, on the average, less than men.

Why the Difference?

Why the difference between women's version of the situation and reality? Lightfoot suggested women have bought the industry's promotion of the myth that DP has avoided the discrimination traditionally found in other industries because it is relatively new.

"Women aren't active in fighting discrimination because this is an industry where women themselves believe the propaganda," she said.

Whether or not the issue will be a dead one 10 years from now is dependent both on women becoming more visible and on their employers putting greater effort into noticing them, according to members of a panel discussion on promoting women held this fall.

If that doesn't work, women might find some small comfort in CW columnist Herb Grosch's rule of thumb that "in the end, everybody, even scientists" have to die and as "the old men sitting on the promotion committees and in the managements above [women] . . . die off . . . the level of management that women in DP are allowed to enter increases."

List of Recalled Cars Aids Potential Buyers

WASHINGTON, D.C. – The National Highway and Traffic Safety Administration (NHTSA) of the Transportation Department has built a computerized list of motor vehicle recall campaigns by individual vehicle identification number (VIN) and by recall campaign.

The system enables someone who is considering purchasing a used car to find out whether the vehicle contains any uncorrected defects.

Manufacturers are required to submit quarterly reports by VIN to enable owners to find out whether their vehicles are or ever have been subject to a recall campaign.

There is no charge for a search on one vehicle, and the agency promises answers within 24 hours after receipt of the request.

To check the recall status for a specific auto, a requestor can send his name, address, manufacturer's name and the VIN number of the vehicle to NHTSA's Office of Consumer Services here in Washington, D.C., 20590.

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With Ervin's Retirement

Crime Data Protection Legislation at Low Ebb in '75

By Nancy Freneh
Of the CW Staff

Congressional activity aimed at protecting the privacy of criminal justice information seems to have languished this year with the retirement of former Sen. Sam Ervin, privacy's leading proponent.

Sen. John Tunney (D-Calif.), his replacement as chairman of the Senate Constitutional Rights Subcommittee, earned himself bad marks in the *Los Angeles Times* for supporting criminal justice information bills that journalists there viewed as sabotaging "freedom of the press" in reporting on crime.

Tunney, who is up for reelection in November, suffered for his efforts, yet his staff members toil on in search of a compromise bill that satisfies the constitutional rights of criminal offenders without hamstringing legitimate law enforcement activity.

In the House of Representatives, where responsibility for drafting a criminal justice information bill lies in Rep. Don Edwards' (D-Calif.) Subcommittee on Civil and Constitutional Rights, bills have been drafted and redrafted.

However, criminal justice information problems were placed on the back burner when the subcommittee was assigned the job of writing a municipal bankruptcy law when it appeared New York City might go under.

In recent weeks, that committee has been further bogged down over the issue of the Federal Bureau of Investigation's reported mishandling of investigative information that might have led to Lee Harvey Oswald's detention before President John F. Kennedy's assassination in Dallas in 1963.

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The hearings brought bright lights and cameras, but no new answers.

After reassessing time estimates, both Senate and House subcommittee staff members predicted bills will not be ready for consideration by their respective Houses until sometime during the first quarter.

While legislative action seemed to diminish in 1975, activity in the executive branch – especially in the Justice Department – was stepped up sharply, first in May, with the issuance of formal rules and regulations for handling criminal justice data.

The new standards were imposed on every law enforcement agency that had ever received funds from the Law Enforcement Assistance Administration (LEAA) or interfaced with the National Crime Information Center (NCIC).

Although the regulations merely formalized existing practices in most cases, they did provide for individual access to one's own arrest record and for updating and completing as well as limiting dissemination of arrest information without dispositions.

The rule mandating dedicated computers for crime data brought a storm of protest on cost grounds from state governors, attorneys general and DP professionals who accused federal officials of substituting hardware for proper management.

Five months later, the Justice Department backed off and revised its rules to specify only that systems be secure, leaving the dedication vs. shared system decision up to the individual states.

Opposition Thaws

Observers said the Justice Department's attitude against legislative control, frozen into absolute opposition during J. Edgar Hoover's reign as FBI director, is thawing.

As evidence they cited Attorney General Edward Levi's October decision to defer further development of an FBI-controlled message-switching system until Congress has time to propose legislation – a move considered by some to be a landmark decision.

Spokesmen on Capitol Hill said the most recent versions of the criminal justice information bills would not permit an FBI-controlled message-switching system.

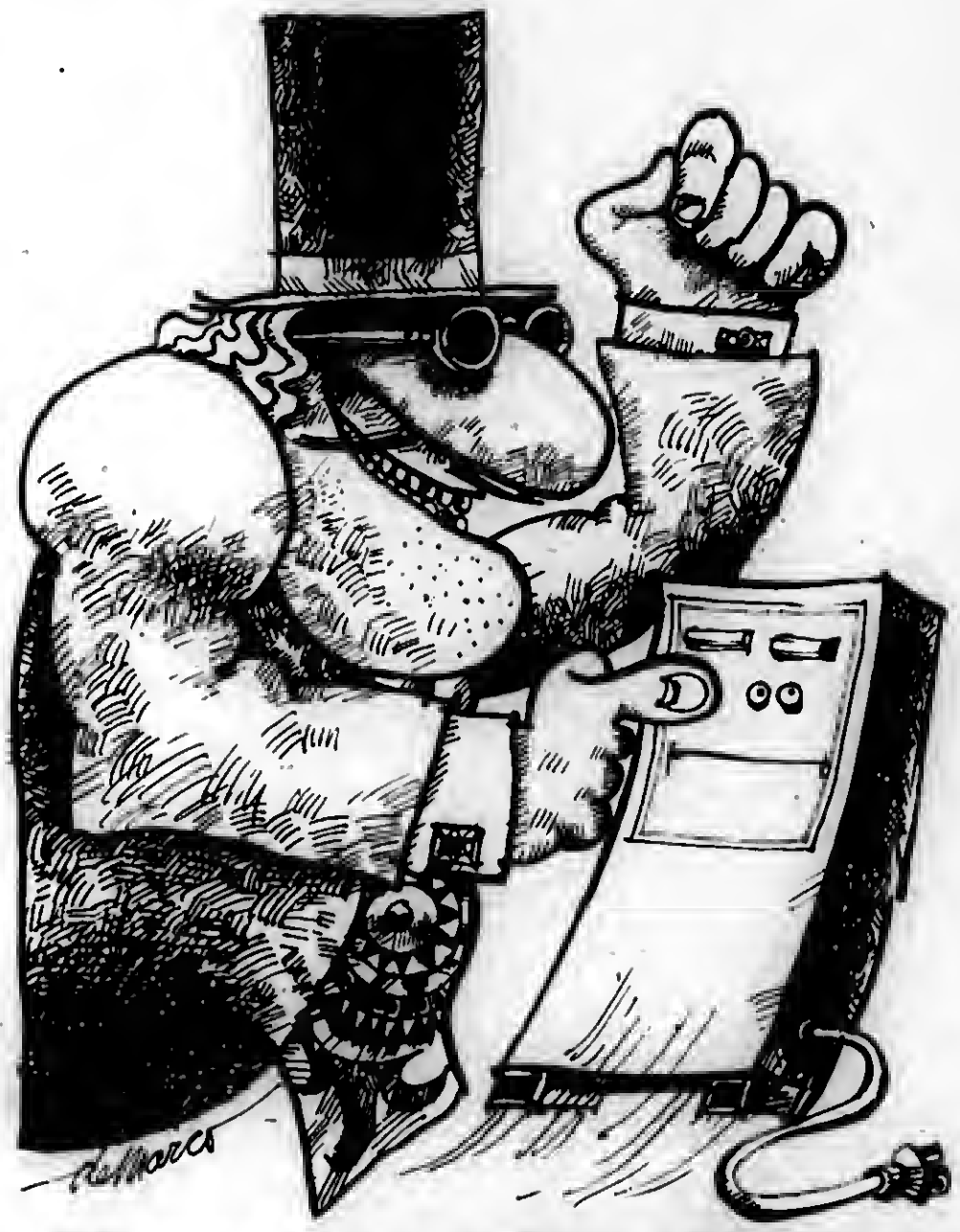
Observers also noted the Justice Department's apparent recognition of the importance of the states in the law enforcement process and the dangers posed by an over-powerful federal police force.

Justice Department officials have become increasingly cooperative in helping iron out problems encountered in writing a good crime information bill, one Congressional aide said.

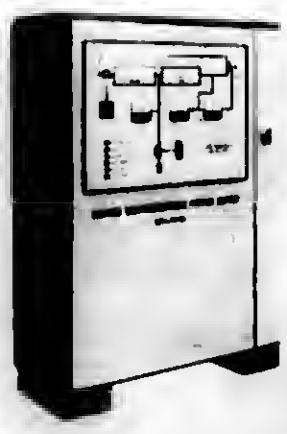
The year 1975 saw the number of states entering data into the FBI's Computerized Criminal History System increase from four to seven, and LEAA's annual obligation of funds to state and local projects rise to more than $861 million from $821 million spent the year before.

The year also saw an innocent Florida man slain by a state trooper whose use of force was ruled justifiable because erroneous information had been given him over his two-way radio – information that was based on a misinterpreted record from the state's computerized criminal information system.





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Start of U.S. vs. IBM Antitrust Trial Just the Beginning

By Edith Holmes
Of the CW Staff

NEW YORK – In antitrust circles within the computer industry, 1975 will be known as the year U.S. vs. IBM went to trial.

The magnitude of that feat can't be conveyed even by recalling the government's case against IBM had been in preparation for six years and 122 days when it opened in the U.S. District Court for the Southern District of New York here on May 19.

It is the most massive antitrust case yet to come to trial, a trial which will probably be one of the longest on record.

But beyond the fact that U.S. vs. IBM has started, the government has made little progress in marshalling the evidence and processing the witnesses it hopes will show IBM monopolized and intended to monopolize the general-purpose computer systems market.

Assuming the current estimate that the Department of Justice will complete its direct case by this time next year, IBM won't even begin to present its defense until early 1977.

The government has charged IBM with a violation of Section 2 of the Sherman Antitrust Act – the central law dealing with the definition of monopoly and the remedies available to those seeking relief from a monopolized industry. If it is to prove its case, the government must show IBM did have a monopoly in the systems and peripherals markets.

In addition, the attorneys with the Department of Justice plan to prove IBM's "intent" to monopolize these markets by detailing marketing practices, not in and of themselves illegal, which the corporation has used.

These practices include "bundling" into one price the separate costs of each part of a computer system, the use of "paper" or "fighting" machines to stave off competition in the field and a discriminatory employment of educational allowances or discounts.

In addition to showing IBM used these tactics to the detriment of other manufacturers in the systems business, the government also intends to prove IBM's conduct in the peripherals market – essentially the case brought by Telex Corp. against IBM and settled earlier this year – provides a further example of the corporation's efforts to maintain its dominant position.

For similar reasons, the government plans to bring IBM's conduct toward leasing companies to the court's attention.

Indication of Success

For its part, IBM counsel has indicated it will prove the corporation hasn't done anything illegal; IBM may dominate the marketplace, but its position is only the result of its success.

That success, the defense will argue, is based on the fact the corporation's management risked the entire organization on the development of the computer industry. Right decisions at the right times in seizing product, marketing and financial opportunities justified that risk.

As the government has presented the market definition portion of its case over the last few months, attorneys for IBM have repeatedly called into question the validity of a "systems" and other markets the government would define during its cross-examinations of government witnesses.

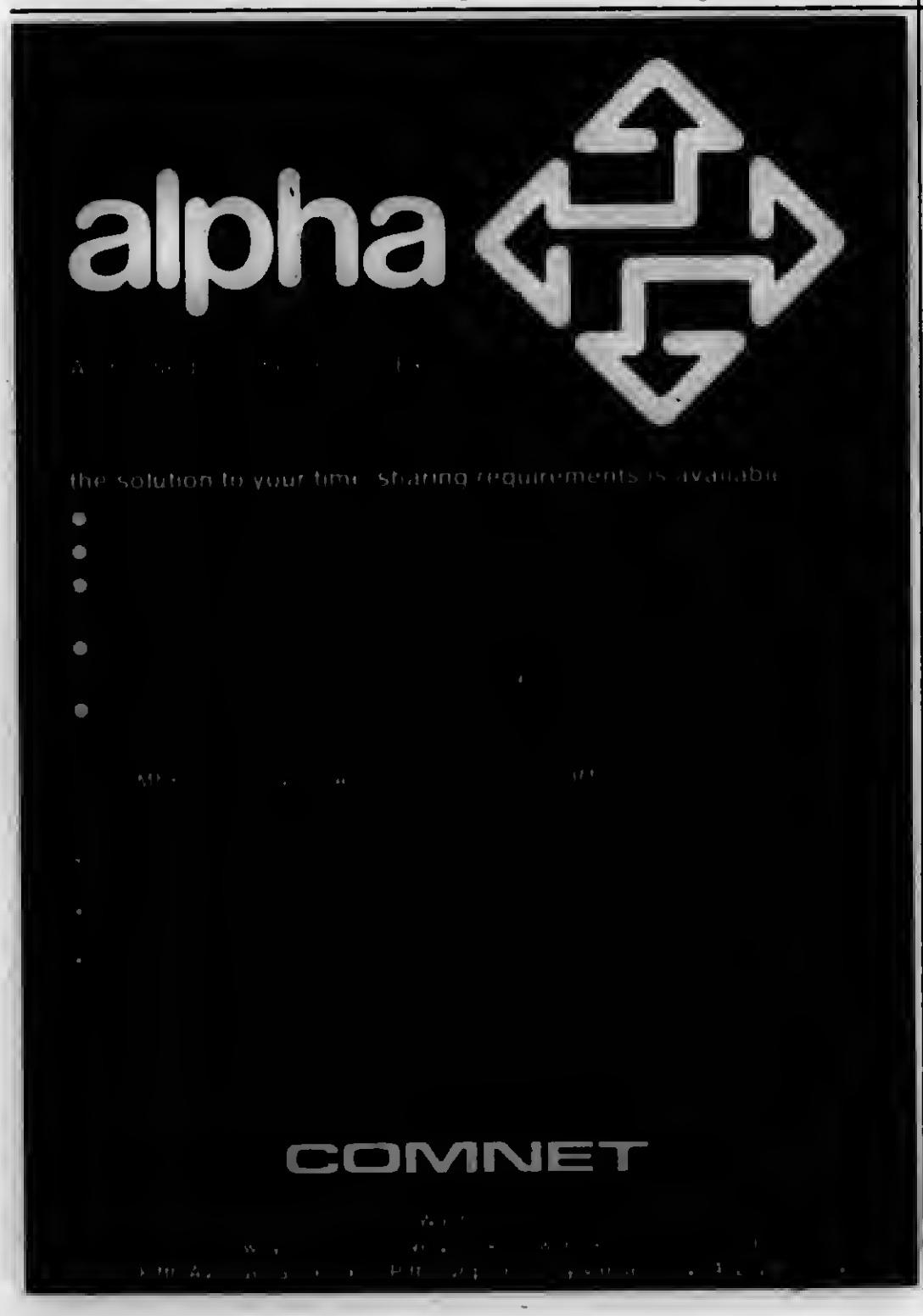
When the time comes for IBM to present its defense, the corporation will try to show there are currently over 100 firms competing in the computer business with new entrants every day – hardly the marketplace of a monopolized industry.

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But IBM's direct case is a long way off. The government has completed the testimony of 17 witnesses in 18 weeks of trial resulting in nearly 10,000 pages of transcript. While there have been many recent deletions from the list of those to be called to the stand, some 90 people are still scheduled to appear in court on behalf of the government.

The government has been particularly concerned with establishing the existence of the systems market, the names of the major competitors, their shares of the total computer business pie, the dominance of IBM in the field and the existence and use of the marketing practices mentioned above.





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Editorial

A Needless Killing

A Florida man was slain needlessly early this month because a skittish state trooper thought the car he was approaching was stolen.

Given that fact, the trooper felt the driver could be dangerous. When he approached the car, the driver's peculiar, jerky motions and failure to follow instructions led the trooper to believe the driver was reaching for a gun.

Trooper Robert Rennie Jr. shot the man in what he believed was self-defense [CW, Dec. 10].

Frank Booth, the driver, is dead – not because of police brutality or police overreaction, but because of sloppy recordkeeping in a poorly conceived or maintained criminal justice information system.

The trooper, who saw Booth parked alongside the highway, no doubt stopped to see if the driver was in trouble – to see if he could be of assistance.

Rennie called in the vehicle's license number as a routine self-defense measure and, much to his apparent surprise, was informed via his two-way radio the license number he had just fed in was a "hit."

The number would have been a hit had the year been 1971. It was not a hit in 1975. Rennie didn't know, however, that the record he had brought up was entered in 1971. And he didn't know that same license tag number had probably been issued to three different individuals since the original auto bearing that tag was stolen.

Until 1974, Florida assigned new license plates with the same numbers to different individuals year after year, without checking whether the number was listed in a wanted or stolen vehicle file in the state's criminal justice information system.

The trooper involved was suspended immediately pending the findings of a coroner's inquest.

After reviewing the evidence, the coroner's jury found Rennie's use of force "justified" under the circumstances, and the trooper was cleared [CW, Dec. 17].

But the matter should not stop there.

There is no need to heap extra pressures on the policeman on his beat or a trooper on the highway by providing criminal justice information he cannot trust.

Almost in spite of Florida's motor vehicle licensing practices, that state's criminal justice information system, which depends heavily on such data, allows old records and new records to be mixed indiscriminately in its stolen property and wanted persons files.

There is no excuse for this. While software is available to place old records under a different security category in a complex, on-line criminal justice information system, this seems an unnecessary expense for outdated records.

Such files should be deleted from the system and stored off-line, where they could be accessed if needed to identify a vehicle found at the bottom of a lake, for example, while avoiding the possibility of such an unnecessary killing or even arrest occurring again.

The state's motor vehicle licensing policy was changed in 1974 and drivers now retain the same number indefinitely. Interestingly enough, this was not done because the system was poor, but because of the high cost of issuing new license plates every year.

The problem of misinterpretation, however, will not be eradicated until the criminal justice files are entirely purged of outdated records. This work should start immediately.



Letters to the Editor

Data Entry Suggestions Recall 'Age of Managerial Ignorance'

E.M. Hughes told us more about himself and his company than he told us about "average" keypunchers ["Psychology Reduces Data Entry Inefficiency," CW, Dec. 17].

His attitude is such that he should never qualify for a management position. I believe he is a frustrated programmer working in a big shop with a gigantic ego to match the chip on his shoulder.

In terms of professionalism, where are the sources to support his claims? Where did he get his data?

Hughes is telling us that his company destroys the initiative of its operators, engages in petty practices and is the victim of the resentment that is created within the data entry group.

Hughes thinks it is not necessary to relieve the boredom of his shop by conversation, smoking, coffee breaks or rest periods. He thinks he knows more about the job than the people who work at it every day. Rather than learning from what they could tell him, he ignores and abuses them.

Hughes is not a modern manager but a throwback to an age of managerial ignorance. He would be much happier if he could walk into his shop in the morning, turn on the robots and punch the buttons.

Unfortunately for him, the robots still need human brains to work, and those brains are to be found in human beings. Hughes needs some lessons in respect and tact.

Frederic McNally

N. Syracuse, N.Y.

Elizabeth M. Hughes' reader commentary was based on her experiences working as a keypunch/keytape operator for a year and a half. Part of that time was spent at a small service bureau, the remainder at a large in-house facility. Ed.

Experiences Make Good Reading

After reading the responses of Ken Yoder and Donald Collins [CW, Dec. 17] to my letter of Dec. 3, I was surprised it deserved such zealous replies.

Yoder has convinced me he is convinced NCR is now a responsive company. Things have obviously changed since my involvement with the early Century series.

Collins referred to my letter as a "classic example of hasty and poor judgment." It may have been "poor," but it was not "hasty."

I am not a theoretician on NCR – I have dealt with them. Don Masterson's presentations on Midlands' "On-Line Management Information Systems" might be good, but his papers have little or no relationship to the virtues of NCR.

Some installations are successful in spite of their vendor or hardware but, more importantly, user expectations of vendors and hardware vary from company to company and person to person, thereby giving birth to a variety of experiences and opinions which makes good reading in *Computerworld*.

David L. McMonigle

Caledonia, Mich.

Credit Bureaus Misrepresented

Humor is fine, but it was somewhat discouraging to see the misimpressions about credit bureaus that were conveyed in the editorial page cartoon appearing in the Dec. 10 issue of *Computerworld*.

Contrary to the cartoon's implication that any credit bureau might have the denial of accounts as its primary purpose, credit bureau reports facilitate the establishment of new accounts in some 90% of the occasions of their use.

The suggestion that investigations enabling credit grantors to make sound credit decisions constitute invasion of privacy place CW's cartoonist in a distinct minority of opinion.

According to a recent Opinion Research Corp. poll, 95% of its respondents agreed credit grantors have a right to information concerning an individual's ability to pay his bills. It is precisely this information that credit bureaus provide.

J.V. White
President

The Credit Bureau, Inc.
Atlanta, Ga.

A Lot to Lose

Herb Grosch, in his Dec. 17 column, said "we have everything to gain and nothing to lose" by selling sophisticated computers to Communist countries.

We have quite a bit to lose – our national security, for instance.

Just what does Grosch think the IBM 370/168s will be used for – playing simulated football games? Is it beyond his conception they might be used to develop weapons systems which could be used against the free world?

Why, on God's green earth, should bourgeois capitalists help Bolsheviks better run their police state?

In an era when Western military superiority has become not so superior, I find at least one bright spot in the fact that there is a "five- or six-year gap in computer technology between [the Communist countries'] efforts and those of Western societies."

Viva la gap. May it grow ever wider.

Richard L. Grossman

Chicago, Ill.

(Other letters on Page 18).

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Wring Out the Old!

And so we bid an unreluctant farewell to the last full year of the Fourth Generation – a generation that began with a whimper in 1970 and will end with a bang late next spring. Out in the real world, it was a year of doubt and dismay, as years usually are since the United States lost heart in the Sixties. But it was a year tempered by hope, as the economy turned upward and a merciful if rather tardy Providence removed two lamentable incrustations, Francisco Franco and J. Edgar Horror.

Closer to home, it was a year marked by the unveiling of Gene Amdahl's small giant, the withdrawal of Xerox and Philips, and Honeywell peddling Bull back to the Gascons. It was the first year for t6K chips and the first of many "last" years for cores (It must be nearly two decades since I first heard, "This is the *last* year for the 80-column card"!)

Fantastic progress in microprocessors; a new set of enthusiasms and slogans – but, as usual, no actual improvement – in software. Genuine but not particularly fruitful concern for the social interactions of our trade; comissions appointed, reports rendered, standards adopted – mostly tongue-in-cheek. Ten paces forward, nine paces back.

Perhaps more than any other, it was the year when IBM's legal prowess became obvious. In courtrooms and in judges' chambers, and in plush law offices where compromise and the civilian equlvalent of plea bargaining takes place, the flimsy ghosts of antitrust and user rights were exorcised.

It was a year for rationalization and consolidation. Good service firms, good software packages, good data networks prospered. There were flurries of excitement about facilities management and the first skirmishes on the commercial packet-switching front. The really big systems flourished, or at least the vast majority; there were rumors that Livermore, that conduit through which the huge CDC machines passed on their way to secrecy and oblivion, waa in flux. And the lock-the-door-at-five-and-go-home minisystems sold better than food stamps.

Seminars, road shows, exhibits did well. IBM reserved an extra-large prime space for next year's NCC gala. The usual dull technical papers and vacuous panels proliferated *a la* Parkinson at myriad meetings, and the academics huddled over their paltry politics. The struggles inside ACM between the Establishment and its opponents sharpened. The financial and organizational problems in DPMA leveled off. And Ken Lord remained mischievous.

Japan continued to be the rapid-growth region of computer use, worldwide. The British and the Italians, snarled in unworkable economics, drew much sympathy (and precious little else) from the computer community. The big news for the French and the Germans was the struggle for Unidata, which like a football is of low intrinsic value, inflated to the limit and kicked around by everyone – but the focus of all eyes nonetheless. East Germany sold a big (for it) computer to Control Data, which hopes to reciprocate in spades: say, a biltion dollars worth of jazzy disks and tapes and printers. At the end of the Forties, abstemious IBM took its Spanish and Portuguese profits in sherry and port; CDC, if it barters with the East, may end up with vodka and 5-put Tokay. Suggestion: mix 'em over crushed ice and call it a Norris Wallbanger!

The big sleeper of the year was not Amdahl/Fujitsu, which had been on the front burner for some time, but the awakening of the business community to the costly realities of personal data privacy and security. Ignored for several years, and in many contexts actually advocated or at least given lip service, privacy and concern for human rights now turns out to require (what else!) lots more core, lots more disk, a dozen new kinds of logs and records, oodles of unwritable software, and bushels and bushels of bucks. And the stable door is open: the public, which could easily have been steered away by adroit PR tactics, is atert to the problem. Privacy sells! Sells papera and magazines and talk-show attention. The credit bureau ogres and the bureaucrats are just beginning to realize that benign neglect was *not* the correct entrepreneurial stance. Hah!

For me personally, 1975 was a year not of waiting for neo-FS and a thousand on the Dow, but of vigorous change. I changed my relationship with *Computerworld*; I moved to California; I married again. I lost an old and dear friend, Stan Gill. I made new friends, and new enemies. I flew a hundred thousand jet miles, and drove three thousand with an old pet: over Tioga with Cat Chow and litter box! It was a good year for me, a vigorous year, a year of new beginnings. Next year I expect to stay fairly firmly rooted, while the computer world writhes and groans and comes apart at the seams. Come on, 1976, you berserker; bite your shield, howl tike a wolf – I'm ready!



Herb Grosch

Information Sought on Check-Digit Monitoring Efforts

A coupte of months ago a discussion of check-digit methods in this column turned up a totally new method being used in Florida by Digitex Corp. (CW, Oct. 22].

Catled the Deeds method after its developer, Dr. Joseph Deeds, the system was based upon defining a apecial multiplication table which had none of the ambiguity problema of the standard multiplication table. Thus the Deeds method waa able to avoid some of the problems that occur In check-digit methods using weighting multiplications of various types.

The Taylor Report
By
Alan Taylor, CDP



At the same time, Deeds introduced the idea of keeping "0" as an identity, which keeps a check digit once computed for, say, a six-digit number also correct for the same number in a seven- or eight-digit or longer system. This was a major breakthrough, but is not the one we are concerned with now.

During the discussion it was suggested that one way of using the Deeds method is to note the cases which it is known not to detect completely and eliminate them.

There are objections to this approach, not the least being the fact that I at least didn't know how to find the potential error pairs – i.e., the sets of two numbers which would permit some changes and yet be able to pass through the checkout routines.

Minimization Rejected

The matter of detecting these errors then took on a new urgency when Magdi Riskalla pointed out this approach – using statistical methods to identify and eliminate problem areas, rather than simply minimize them as has been the practice to date – could perhaps lead to another breakthrough. But first a method of locating those errors had to be found.

Traditionally, check-digit error anatysis estimation has concentrated almost entirely upon two types of error:

- Single-digit transcription errors.
- Two-digit transpositlon errors.

The single-digit transcription error occurs when a single character in the checked number is incorrectly reported for any reason. For instance, 12346 would be a single-digit transcription error for a correct number 12345. So would 22345 or 13345.

The two-digit transposition errors are equally easy to describe, but a lot harder to identify as really being ambiguous within a specific checking method. The error consists of simply changing the values of two of the digits in the correct number. The number 12345 gives rise to possible transpositions of 21345, 32145, 42315, 52341 or 13245, for example.

Normally, in examining a check-digit method, these are broken down depending upon the number of digits that come between the two transposed digits. The number 32145 is a transposition over a single intervenlng digit, while 52341 is one over three intervening digits.

The various methods give different percentages of success faced with these transpositions – but so far do not lend themselves to identifying In advance which numbers are subject to higher error rates.

Case Identification

tt now looks as though this can be done for both single-digit transcriptlon and two-digit transposition errors. Raw numbera, if sorted by four fields (check-digit, sum-of-digits, the greater of each potentiat transposed pair and a transformed number with both digits eliminated or set equal) will have dupticate equal sorting positions whenever any error can slip through a particular system. This identifies each possible error case for further study.

All well and good – and this is now proceeding. However, it really isn't enough, because It is based upon potentially outdated thinking on what errors are being checked for. Potentlally outdated – but perhaps still accurate thinking. We just don't know. So that is where the probtem lies today.

And that is where your hetp is asked to find out whether the traditional error thinking is still valid.

The single-digit transcription and two-digit transposition errors are both humanly-based "thinking" errors from punched card days.

Factually, we need to know more about what errors are actually occurring and under what circumstances. In particular we want to know what other errors beyond the two traditlonal cases are occurring and how frequently, at least by comparison.

Do you know, by any chance? Is someone around that is keeping some sort of monltoring operation going that can give some clues to the actuat situation?

If so, please write and let us know.

A questionnaire is enclosed to help you. In the meantime, work on check dlgits is going on and further news will be given in the column as it progresses.

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ERROR-MONITORING QUESTIONNAIRE

Item being monitored (account number, X-ray identification, etc.): _____

Field length: _____

_____

Protection method(s) used: _____

_____

Monitoring methods: _____

_____

Monitoring results (if known): _____

_____

_____

Suggested contact point: _____

_____ Phone: _____

Name _____ Position _____

Address _____

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Letters to the Editor

Programmers Should Learn To Use Available Tools

Many of the recent letters concerning debugging Cobol programs from core dumps were totally ridiculous. Programmers who debug from core dumps have been called, in effect, garbage men.

D.S. Owings [CW, Dec. 17] apparently has a group of magicians which has never needed the Abend address, data being acted upon or even the determination of cause (data, hardware, software, etc.) to debug Abends.

In the real world, all of the advocated tools (core dumps, programmers' guides, sophisticated software and individual experience) are needed and commonly used in Abend solution. Unfortunately, all of the above tools are usually in equally short supply.

Roger Poole [CW, Nov. 12] had the right idea. If debugging from a core dump is necessary (I believe there will always be some occasions), then certainty a "Debugging From Core Only" guide will be welcomed by a majority of the programming community.

In short, programmers should spend tess time carping and more time discovering how to effectively use the available tools. If a better way is available, find it and/or devetop it.

After all, that's what we get paid for!

William L. Maltby
Information Systems
Western Electric Co., Inc.

Packages a Possibility

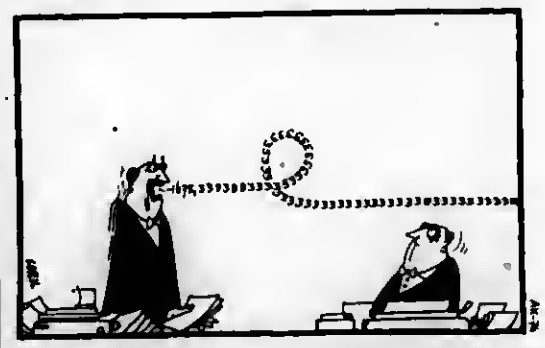
A recent tetter from Roger Poole [CW, Nov. 12] requested titerature on debugging from core only.

I was a Cobol programmer for several years before I left my position to return to cottege. My former employer had purchased a software package that improved the core dump.

The package tocated and identified key areas in core dumps and printed them in readable form. This greatly reduced my program debugging time.

I suggest that Poote investigate programs of this type to see if they would be useful to him.

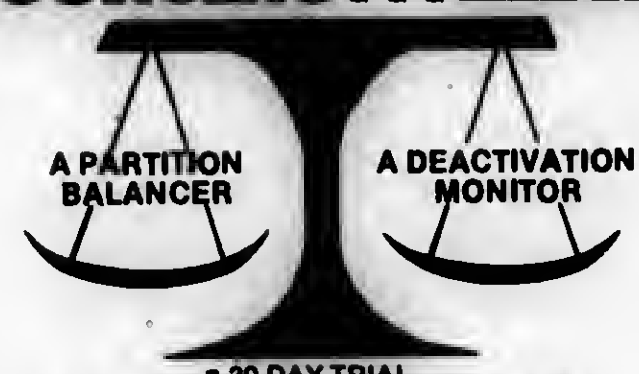
Mary Botton
Orange, Calif.



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N.Y. Bank Backs Career Pathing With 'Draft System'

By Don Leavitt
Of the CW Staff

NEW YORK – Many installations are beginning to realize successful DP depends on the ability to attract, motivate, guide and satisfy the people who work with the hardware and software. But few have done anything much with that realization.

Manufacturers Hanover Trust Co. is an exception. It recognized the problem, brought in a consulting group to gain insight into what should be done and then established its own internal organization to provide ongoing people-sensitive management within the DP function.

The New York-based Berton Group helped in several ways, according to Charles D. LaBell, "Manny Hanny's" vice-president of DP human resources.

The consultants supported the bank in its efforts to identify what tasks actually had to be done by personnel within the DP organization, which positions should have responsibility for each task and what skills were needed by people in order to fill those positions.

More than that, the Berton Group also helped identify the skills required to move from one position to another and the educational tools that could provide those skills.

Once that base was developed, the bank modified its own structure to take advantage of the new interest in people. LaBelle's human resources function was set up on a par with DP production and system development.

With responsibility for securing, organization and control as well as evaluation and review of people, LaBelle reports to the same vice-president as the other two managers.

Within his operation, LaBelle has two subfunctions: human resources acquisition and human resources development. Clearly these are related, he admitted, but they do have some very different responsibilities as well.

The bank is strongly committed to internal mobility as a means of filling vacancies, and half the acquisition function is geared to supporting just such a mobility, he went on. One of the most unique functions the acquisition subfunction supports is a "draft system" which operates "like Pete Rozelle's NFL draft," according to LaBelle.

Managers in need of people meet and review the skills profiles of bank employees. The managers with the most critical needs get first crack at anyone they feel is qualified, even if acceptance of an offer would lead to a transfer across department lines.

Unlike a military draft – and perhaps unlike Rozelle's as well – the "Manny Hanny" draft call can be refused by the selected candidate. And a refusal will have no negative impact on later reviews of the candidate's skills or performance or any salary increases to which he might be entitled, LaBelle emphasized.

The other side of the human resources acquisition operation deals with hiring new employees from outside and the management of consultants when a temporary need for special skills is recognized.

The development half of LaBelle's operation is also split in two, differentiating

Peopleware

between career development itself and the education required to foster that development or to satisfy the needs sensed by DP staffers, even if their desires are not immediately related to their career path.

Performance analysis and career counseling are the main activities on the "development" side of this subfunction. The performance analysis includes periodic self-evaluations of each worker's effort as well as evaluation by his manager.

But this part of the human resources staff also supports an ombudsman who is available to mediate in case of problems that can't be resolved by more conventional means.

Does LaBelle's approach work? It apparently works for the DP operation, he said, and now the comptroller's division is studying the possibility of applying the same kind of approach to its operations.

'Cogent' Simplifies Language Building

ORINDA, Calif. – Users faced with the prospect of generating compilers can work with a metalanguage that describes both the syntax and the semantics of a language as part of the Cogent system, according to the vendor, Virtual Memory Systems (VMS).

By supporting both syntax and semantics, Cogent is said to cut compiler development time to "only six to eight weeks of programming time."

The system is "highly machine-independent," a spokesman said, adding that it has been implemented on "several" minicomputers and in IBM 360/370 environments.

Cogent is "well-sulted" for the development of compilers for industry-standard languages such as Algol, Cobol or Fortran. It can also be used to build special-purpose compilers for system programming languages, information update and retrieval, logic testing and other special applications, he added.

Designed for Flexibility

Cogent was designed as a flexible system and can be tailored to meet unique language requirements by means of user-supplied parameters. Compilers produced by Cogent consist of Assembly language statements or source language statements to be translated by an existing compiler, VMS said.

As a result of its organization, Cogent is useful as a means of converting programs written in one language to run in another language environment, the spokesman added.

Compilers produced by Cogent may operate interactively, he said, and actual application programs may execute interpretively if desired. Since Cogent itself is modular, extensions to its capabilities can be added as the user defines them.

Cogent was designed to operate on a wide range of equipment. Primary requirements, however, include a sequential input device, a sequential output device, a listing mechanism and, the vendor noted without comment, a processor.

Minicomputer core requirements typically are 24K bytes, while IBM users generally need less than 256K bytes.

Sold as a licensed product including implementation on a specific CPU, training, maintenance and a one-year warranty, Cogent costs $32,000. VMS is at Suite 3, One N. Hollywood Drive, 94563.

RSTS/E Gains an 'Assist'

MAYNARD, Mass. – Now available from Digital Equipment Corp., Assist-11 was designed to provide on-line display of telephone directory entries for operators.

The software works under RSTS/E on PDP-11 systems.

Multiple operators can have simultaneous access to as many as 20 million directory entries stored on magnetic disk with Assist-11, which provides quick updating as well as rapid response time, DEC said.

License fees for the software begin at $5,000.

NCR 770s On-Line to Centers

DAYTON, Ohio – Financial institutions will be able to use NCR 770 self-service banking terminals on-line to NCR's data centers beginning in mid-1976, the company announced recently.

The devices can be used off-line now.

Cobol Compiler Audit Routines, Results For Sale

SPRINGFIELD, Va. – Summary results of tests run by the Federal Cobol Compiler Testing Service to validate various compilers [CW, Dec. 24] are now available from the National Technical Information Service (NTIS) here.

For users wishing to run their own tests, NTIS also has magnetic tape copies of the audit routines, a users' guide and a 12-volume set of test specifications organized by function module with the 1974 American National Standard.

The Cobol Compiler Validation System – the magnetic tape of the actual routines – is cataloged as ADA017941 and can be acquired for $500. The users' guide (ADA017940) costs $5 in hard copy or $2.25 in microfiche.

Microfiche copies are available for $2.25 each, NTIS noted from 5285 Port Royal Road, 22151.

NTIS No.	Vendor or Machine Environment	Compiler Identification	Cost*
AD786570	IBM 370/155	V2 OS	$6.50
AD786571	IBM 370/158	V4 VS	$4.00
AD786572	Univac 1106	AB Exec B	$5.25
AD786573	IBM 360/B5	V3.1 OS	$6.25
AD786990	HIS OS2000	V2.1	$4.25
AD786574	CDC CYBER-70	VPOPSR367 Scope	$4.50
AD786575	HB050	WW4.0 NEISOO	$4.50
AD78657B	B3500	MCP V5.3	$B.75
AD786989	Computer Ling.	V1.0	$3.75
ADA002115	Univac 1108	Ansi/Ascii Exec B UNI2.2H	$4.25
ADA00248B	B6700	MCP I1.7	$3.75
ADA010928	HIS 6080	Cobol 2.0/H-EIS*23	$3.75
ADA015189	IBM 360/B5	Version 4 R1.2	$3.75

*$2.25 for microfiche.

Validation summary reports on these 1974 Cobol compilers are now available from National Technical Information Service.

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GRAHAM MAGNETICS

Economic Stress on Users Hikes '75 Software Sales

Review and Forecast

By Don Leavitt
Of the CW Staff

Users were buying more software more willingly this year, but there seemed little if any pattern to new products announced in 1975.

The year to come seems likely to be a lot more of the same. There will still be occasional war stories of things going wrong with outside software, but it's unlikely the mainframers will introduce anything incompatible with the vast libraries of either control or application programs users have developed in-house or acquired from independent software houses.

Ironically, perhaps, it was the generally poor economic environment that led installations to look to outside sources for packaged support.

Over and over again, vendors said they felt buyers were committing themselves because their upper managements were pushing to get more immediate payoff work on their computers quickly.

Budgeting, product control, financial planning and even computer performance evaluation packages were all well received this year apparently, although plain old bread-and-butter accounting application software was also sought out and acquired.

But economic conditions weren't the only things leading users to outside sources. There seems to be a growing sense that the software industry is maturing and that there's a good chance a package acquired from outside will work.

No New Products

The industry's maturity showed itself not only in the way users spoke of vendor support – during installation and when problems showed up later – but in the "new" products introduced during the year. In a general sense, there were no new products.

That statement is unfair to a lot of vendors who did announce innovative software, but it sums up the year in which most of the new products were in fact enhanced versions of packages introduced in previous years.

Time and again, press releases told the glories of Release 17.9 of Xerxes I (and vendor forgive me if I happened to use a real product name in that fatuous example!).

Without demeaning the value of this year's crop of enhancements, they are scattered in impact and quite different from the heavy emphasis several years ago, for example, on independent extensions to IBM's DOS, once that system was "functionally stabilized" by the mainframer.

One pocket of new software that puts the lie to that view, but only in part, is the blossoming of vendors and packages geared to the IBM System/32 which was announced this year and to the business-oriented Digital Equipment Corp. Datasystems built on PDP-8 and -11 hardware.

The packages for the S/32 ranged from IBM's own turnkey Industry Application Programs (IAPs) – but no language processor for in-house programming – for a number of target industries, to generalized accounting systems and the Assembler language processor from Apodictics, Inc. in Ann Arbor, Mich.

Cobol for Minis

The availability of at least some sort of Cobol facility on a range of minicomputers was another mark of 1975. Information Processing, Inc. in Florida has a business system utilizing Cobol on Data General Corp.'s Novas and Eclipse units.

Diversified Data Systems, Inc. in Arizona developed Cobol for Interdata's machines, and Varian Data Machines announced a compiler for its minis. In August DEC said it had Cobol for RSTS/E-based PDP-11s and Hewlett-Packard has had the language on its HP 3000 for some time.

Meanwhile, the year of development in data base management systems (DBMS) was marked by Cincom Systems, Inc.'s introduction of Total on Varian equipment. Quick reactions from Microdata Corp and from HP noted that comparable systems (Reality and Image, respectively) had been up and running on their gear even before the Total-Varian announcement was made.

Other data base-mini combinations are in the offing, but the vendors involved are very guarded in what they have to say now.

Full-scale computer users were offered a wide range of data base enhancements during 1975. Software AG's Adabas was made available to IBM DOS as well as OS users, and macro facilities and bill-of-material linkages were also introduced.

Cullinane Corp.'s IDMS also gained a bill-of-material interface during the year while MRI System Corp.'s System 2000 gained a multithread/multiuser facility to speed its operations.

A facility supporting more extensive mathematical computations was introduced as an option to Computer Corp of America's Model 204.

Looking to Codasyl

The most significant support for DBMS may ultimately come, not from any of these particular packages, however, but from action taken by Codasyl, the development group responsible for the Cobol language.

In late spring, it approved a set of procedure division statements to provide direct linkage between a user's Cobol program and his DBMS.

Patent Question

Probably of very little significance to either users or vendors is what the year 1976 holds for patent protection of software. The Thomas R. Johnston record-keeping "invention" now under review by the U.S. Supreme Court will likely be stripped of the protection it won in the Court of Customs and Patent Appeals, but the high court won't answer the basic question of whether any software is patentable.

In any case, even those who think patenting is the way to protect really unique software agree that no more than 1% of all programs would be eligible for such protection.

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"With CULPRIT we could go with any database management system we might choose in the future ... IDMS, IMS, TOTAL ... CULPRIT can handle any of them."
many users

"User departments complained they were waiting far too long for reports. Now, with CULPRIT, they produce their own reports in a hurry and they're happy to do it."
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"The same job that had always taken six hours of computer time with our former "Big Eight" audit package took only 15 minutes with EDP-AUDITOR."
a Southern bank

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a large financial institution

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an oil company

"Management was hard to convince ... however they did let us use the EDP-AUDITOR package on a 3-month trial basis to show results and when they came along with "hurry up" requests that we were able to do right away they said, "buy that system!"
many users

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More Than 1975 Honor Roll

Report Shows Budget Trends, Package Rating Details

By Don Leavitt
Of the CW Staff

DELRAN, N.J. – A report on "User Ratings of Proprietary Software," recently published by Datapro Research Corp., contains considerably more information than a mere listing of those packages that made up the 1975 Software Honor Roll [CW, Dec. 10].

The ratings for the Honor Roll were based on a survey form Datapro sent out to some 26,000 DP executives. The questionnaire included requests for both user ratings of any software they had acquired – apart from the control software provided with their computers – and budgetary information.

A total of 5,277 users, or 20.1% of the addresses, returned forms, Datapro said, and of these 2,761, or 53%, gave some budgetary figures for their 1974 and 1975 software package expenditures or their expected budget for 1976.

Despite some problems which Datapro acknowledged – not all responses showed figures for all three years – the compilation showed an upward budget trend exists.

Just over 1,500 user sites reported their budgets for 1974 and these averaged $14,879. Just under 1,600 installations expect to spend an average of $21,423 on software in 1976, the report showed.

The largest number of responses, however, was for 1975 figures with nearly 2,000 sites providing budget figures for the current year. Confirming the trend pattern, the average for this midpoint in the three-year span was midway between the other dollar figures, at $17,919.

The budget increases are by no means attributable solely to inflation, according to Datapro. "The 'not invented here' syndrome . . . is dying. Granted, it is not dying quickly or easily, but it is showing signs of a progressively fainter heartbeat," the editor of the report noted.

Users are increasingly aware the use of proprietary software, when compared with the cost and uncertainty of in-house development, has a legitimate place in almost every DP installation, the report continued.

The package-rating portion of the report drew 3,986 responses. More than 1,200 of these covered packages rated by only one or two people – which Datapro disregarded – but 2,772 covered packages rated by at least three users, and Datapro tabulated all of these.

The survey asked users to rate any packages they wished on a four-point scale from excellent (4) to poor (1) in each of seven categories, including one of "overall satisfaction." Then the survey probed how soon, if ever, the packages performed as advertised and what cost, if any, was involved in modifying the software to the user's needs.

The Honor Roll was made up of those packages rated by six or more users that earned an weighted average of 3.5 on "overall satisfaction" and weighted averages of no less than 2.8 on each of five detailed categories.

Cost of modification and how soon the software "worked" was not included in the Honor Roll calculations directly, although negative user experience in either of these areas would doubtless have impacted the ratings of the categories that were counted.

Perhaps indicative of why the packages that made the Honor Roll were so highly regarded by their users, however was the overall record of their modification requirements. Across all the Honor Roll packages, 571 users reported no changes were needed, and only 146 said modification was required by either user or vendor.

Fourteen of the packages required no changes and, of the 11 that were modified, the average cost was about $260 – but this included one for which the average cost of modification was reported to be $1,400.

In its comments on the Honor Roll qualifications, Datapro noted the "training" category was not included, but that if it had been and a 2.8 rating required for it as well as the others, 20 of the 25 packages would still be on the list.

Some observers complained that six users is too small a base from which to accord a package meaningful recognition. The report showed, however, that even if the qualifying number were raised to 12, for example, 15 of the original 25 packages would still be on the list, and if "training" were part of the scoring, 13 of those 15 would survive.



'Mark IV' Packaged For Use by Auditors

WOODLAND HILLS, Calif. – A Mark IV system designed for internal auditors is being offered by Informatics, Inc.

Mark IV/Auditor was developed because there was "a lot of demand" for an auditing system separate from the standard Mark IV system, a company spokesman said.

Mark IV is used for the design, implementation and operation of batch and on-line business DP applications without requiring conventional programming methods.

Mark IV/Auditor is a collection of auditing routines which can provide standard aging reports, data valuation, random sampling, stratifications, access to files, automatic sequence and range checking, confirmation notices and extensive matching logic, the spokesman noted.

"Internal auditors previously 'audited around the computer' by confirming totals on files from computer generated reports. With Mark IV/Auditor, they can now audit through the computer by having the system confirm values in the file", the spokesman said.

The Mark IV/Auditor ranges in price from $12,100 to $18,200. The higher price is for a system containing two special configurations relating to additional files.

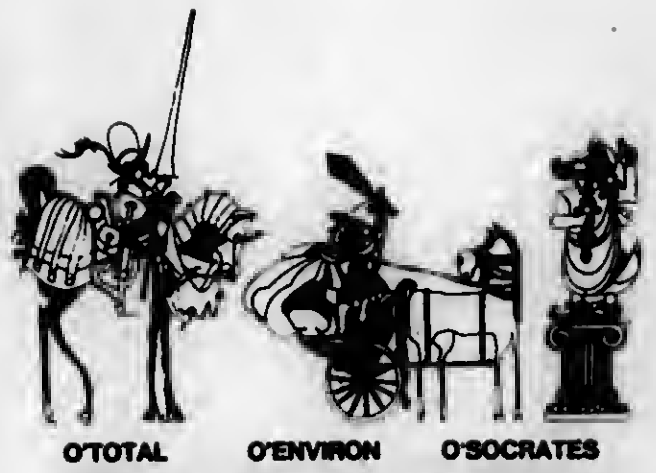
Informatics is at 21031 Ventura Blvd., 91364.

TIME has come





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TOTAL's a real cost-cutter.

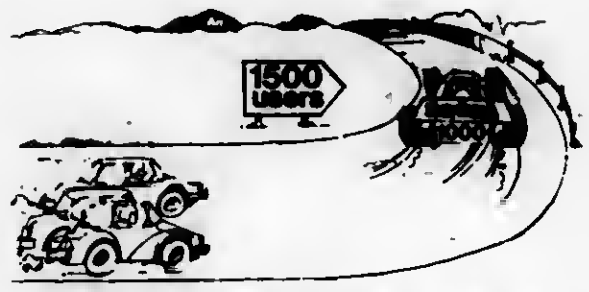


O'TOTAL O'ENVIRON O'SOCRATES

The luck o' the Irish.



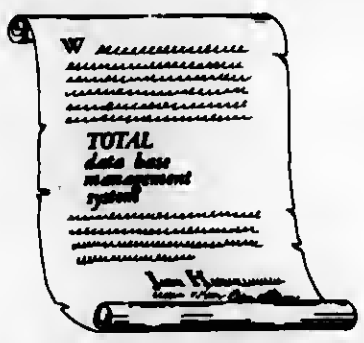
Cincom announces "April Thinker's Day."



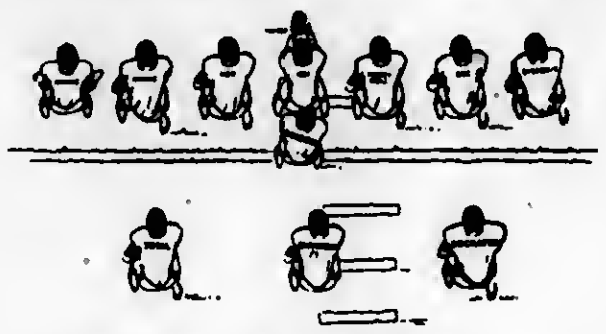
TOTAL roared to its first "500".
And the next "1000" look like a sure thing, too.



Have a June ceremony.
Marry data communications to data base.



Cincom Declares
Software Independence Day



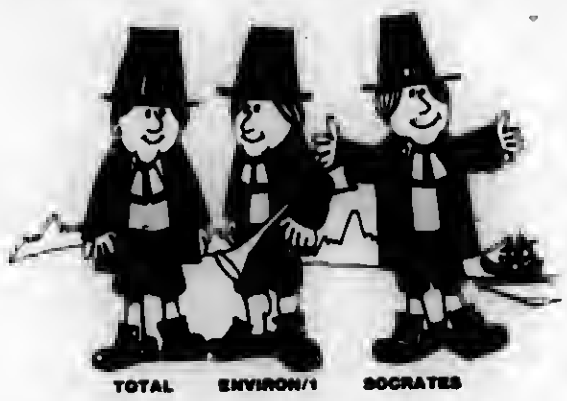
How our All Star data base/data communications team can win for you.



"Laborless" Day.
(the day you take your TOTAL data base on-line with ENTRY ENVIRON/1)



Oh, those data processing horror tales...and how to dispel them.



Just landed in the world of data base/data communications?
Get the Cincom Pilgrim Spirit!

Want a data base management system this year?
Put TOTAL under your tree.



Have a Good Year!

Over the past 12 months we hope you have enjoyed our topical themes highlighting the Cincom story and how our products/services have contributed to the "data base — data communication" successes of the industry.

1975 has been good to Cincom and . . . apparently . . . to our clients. According to the brand new Datapro Research Corporation survey, "User Ratings of Proprietary Software", our *TOTAL Data Base Management System* received a 3.3 out of a possible 4.0 overall user satisfaction rating, with 90% of the users rating the product Excellent (44%) or Good (46%).

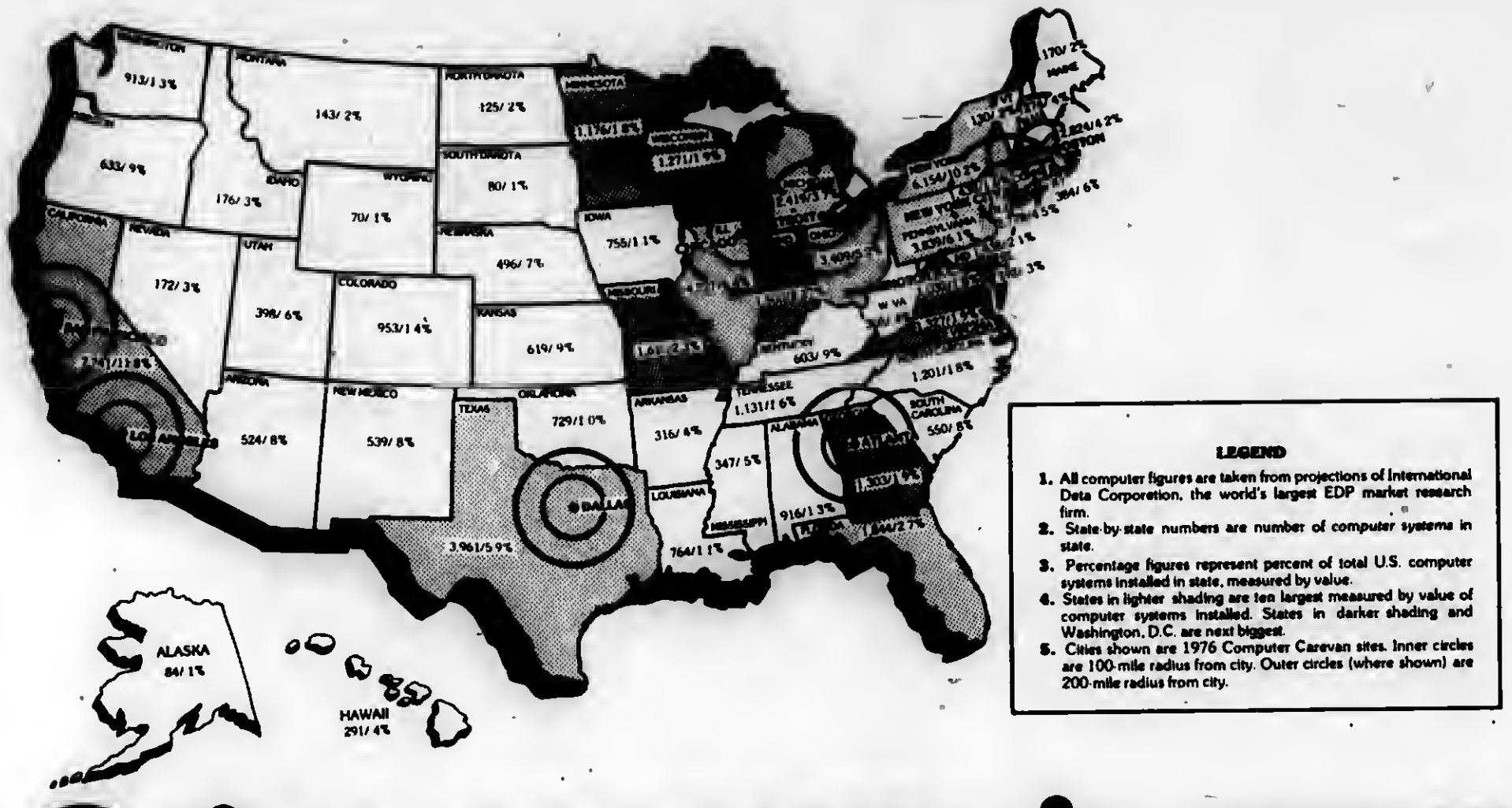
And . . . TOTAL had over *3 times* the number of user responses to the survey than the next rated DBMS.

The same survey reported that our *ENVIRON/1 Data Communications System* achieved a 3.2 overall user satisfaction rating (tops for all rated DC systems), with the categories of Thruput/Efficiency, Ease of Use, and Ease of Installation leading the way.

We look forward to 1976 with enthusiasm and optimism . . . new products, new installations . . . continuing friendships. If this is your year to move into data base and/or data communications, *make sure* it is a good year by joining the successful 1000-strong Cincom client family.

Cincom Systems, Inc: We create merriment.

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LEGEND

1. All computer figures are taken from projections of International Data Corporation, the world's largest EDP market research firm.
2. State-by-state numbers are number of computer systems in state.
3. Percentage figures represent percent of total U.S. computer systems installed in state, measured by value.
4. States in lighter shading are ten largest measured by value of computer systems installed. States in darker shading and Washington, D.C. are next biggest.
5. Cities shown are 1976 Computer Caravan sites. Inner circles are 100-mile radius from city. Outer circles (where shown) are 200-mile radius from city.

Going your way is our way.

Computer Caravan/76 brings a national computer conference to key computer-using states across the country.

Measured by value of computer systems installed, the ten largest states in the U.S. (lighter shading on map) account for more than 60% of all computer systems in the United States. Adding the next biggest areas - 7 states and the District of Columbia (darker shading on map) - we get almost 80% of all the U.S. Computer Installations, measured by value. And it's these key states in the computer world which will be host to - or nearby - one or more of the nine cities in the Computer Caravan/76 - the travelling computer users' forum and exhibition sponsored by *Computerworld*.

To general and data processing management, this means a unique opportunity to see a national computer show without leaving the office for a week and travelling across the country. It's a chance to keep up on the latest information in our user-to-user forums and on the latest products and services in our complete exhibition.

And thousands of key business executives will take advantage of this opportunity as the Caravan moves across the country. The '76 Caravan can expect attendance of over 30,000, and unlike any other computer show, they will represent the majority of the computer installations in the 17 states and the District of Columbia -- that account for 80% of all U.S. computer systems installed. That's true national coverage.

As a marketer of data processing products and services, the Computer Caravan offers you a unique opportunity to meet the professionals who run our country's computer installations in a one-to-one, business oriented atmosphere. Because there are 27 different show days, no one Caravan day is too crowded to give you the opportunity to present your products or services in detail - either on our exhibit floor, or in your own product seminar. And the 1976 Caravan offers several innovations which can make it more suitable to your individual marketing problems:

1. For companies with limited marketing areas, there are 3 regional tours (East, Midwest or West) to choose from - or our new "Major City Tour" (New York, Chicago and Los Angeles). You'll be covering only part of the total market, but that may be all you want - and costs are much less.

2. For companies specializing in the OEM market, there is our new companion show, COMPDESIGN 76. Sponsored by *Computer Design* magazine, this show will appear in the same halls with the Computer Caravan in five key OEM markets: Boston, New York, Chicago, San Francisco, and Los Angeles. It will attract thousands of key computer designers, and will also be open to Caravan attendees in those cities.

3. Data communications marketers can take advantage of our DATACOMM 76 add-on, which gives you a spot in the national data communications show sponsored by *The Data Communications User* magazine.

There's a lot more we'd like to tell you about Computer Caravan/76, but if you're interested in exhibiting, time is short. So send in the coupon right away.

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Commission Less Forceful in Others

Ruling Against DAA Strongest Decision by FCC in '75

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The Federal Communications Commission's (FCC) decision to establish a certification/registration program to replace the Bell-inspired Data Access Arrangement (DAA) will have far-reaching implications as telecommunications users look ahead to 1976.

Users had an indication as early as June that things were going to change. At that time, Walter Hinchman, chief of the FCC's common carrier bureau, said the phone companies were not being hurt by competition.

Irresponsible allegations of economic harm were made by the phone companies at the same time they were making record profits, the FCC official told users at the annual Interntional Communications Association conference.

But the decision to eliminate the DAA is still far from final. AT&T has already filed a request with the FCC for a reconsideration of tbe ruling. If that fails (as it is expected to), Bell will probably take to the courts in an attempt to overturn tbe ruling.

Faltered on DDS

And while the FCC made a forceful ruling in one instance, it was less decisive in handling AT&T's Dataphone Digital Service (DDS). The commission set up a two-tier pricing system that made users in the second group of DDS cities pay about 40% more for tbe same service other users were getting at much lower rates in the five original DDS cities.

This dual-pricing arrangement ended Dec. 15, but the FCC failed to solve the original issues that started the controversy. Some regulatory experts still insist that AT&T has set artificially low prices for the DDS tariff.

If, after investigation, these claims prove to be correct, users might be faced with substantial increases.

One regulatory source said tbe Digital Access Line (DAL) portions of the DDS rates could go up dramatically. A 2,400 bit/sec DAL I line which now costs $65/mo might cost $85/mo and a 2,400 bit/sec DAL II line which now costs $90/mo might cost $110/mo if the commission follows the cost guidelines used by AT&T for other private-line services.

Mileage Rates Up

If the commission ends its DDS proceeding and agrees with this analysis, the mileage rates for users would also rise, the regulatory expert said. At 2,400 bit/sec the cost would rise from 60 cents to $1.55/per mile/mo; at 4,800 the cost for a DAL II would rise from 90 cents per mile/mo to $1.50; and at 9,600 bit/sec the cost for a DAL II would rise from $1.30 to $1.70 per mile/mo.

Users sbould be aware tbese increases will occur only if the commission agrees that AT&T's current rates for DDS are too low and that, as a result, the digital service is being subsidized by other phone comany services, the expert said.

Packet-Switched Issue

In the packet-switcbed service area during the year, the commission still wrestled witb the problem of whether this type of service should be regulated. This question raised the broader issue of the interrelationship between computers and communications.

The distinction between the two is becoming increasingly difficult to define, and there have been indications the FCC is ready to open another computer inquiry to deal with this and related issues.

There was little progress in the Justice Department's antitrust suit against AT&T – most of the year was spent haggling over who should hear the case. An FCC position paper on whether it should hear the Justice Department charges was due to be filed with the court at the end of the year.

Review and Forecast

New Equipment Anticipates IBM's SNA

By Ronald A. Frank
Of the CW Staff

The year 1975 may go down as the period in which communications equipment suppliers tried to prepare users for a newer protocol environment which hadn't quite arrived.

Most suppliers introduced their products with statements guaranteeing compatibility with IBM's Synchronous Data Link Control, even though few such operating sites were identified even by IBM.

And if IBM was considered the equipment leader (which some dispute), the corporation was also having growing pains trying to adapt to the impending emergence of its own defined Systems Network Architecture.

The mid-year reconfiguration of the 3790 terminal system showed IBM could literally change controllers in midstream and alter the entire complexity of a communications subsystem. Having had limited success as a terminal system geared to insurance users, IBM added a key-entry station and made some controller modifications to come up with a data preparation subsystem.

Most significant in that change was the downgrading of an earlier dependence of the controller on the CPU. Instead, the necessary subsystem software resided on a floppy disk in tbe modified controller.

Little Impact on Users

This flexibility on the part of IBM and uncertainty on the part of independent suppliers did little for communications users. For the most part, tbey stayed with conventional half-duplex binary sychronous configurations pending more details on the promised full-duplex protocol environment.

IBM also upgraded its 3705 front end with capabilities that were available earlier from other front-end suppliers. The most notable was the ability to support dual CPUs witb one 3705.

At the communication shows, diagnostic capabilities were stressed and more data communications users seemed to be installing technical control centers to monitor the performance of their lines and equipment.

The innovative services finally began operation during the year with Telenet providing the first commercial packet-switched service. The Datadial service from the Data Transmission Co. and AT&T's Dataphone Digital Service were also available in limited areas.

But the innovative nature of these offerings were not readily apparent since most users gained access through conventional local loops – which meant the familiar modems.

The new services did make it possible for users to compare costs and, in some cases, there were advantages to switching to the newer offerings. The problem was that these services were still limited in their geographic coverage, which made exact cost comparisons difficult.

Despite the new equipment and services, a survey by *Computerworld* showed the typical network user still used mainly AT&T and transmitted data at 1,200-, 2,400- and 4,800 bit/sec. His biggest problem was maintaining line quality and the typical network included equipment from four or more suppliers.

Itam/16 Allows Remote Entry On 16-Bit Interdata Systems

OCEANPORT, N.J. – Interdata, Inc. has introduced a 16-bit version of its communicationa software system that allows Interdata 6/16 or 7/16 users to access remote terminals or computers in a manner similar to how they would access a local peripheral, the firm said.

The Interdata Telecommunicatins Access Method, called Itam/16, is said to add data communications capabilities to the Interdata 16-bit processors.

A minimum Itam/16 system includes a 16-bit Interdata processor such as the Model 6/16 with OS/16 MT2 and 32K bytes of memory, a real-time clock, a control console and appropriate data set adapters.

Itam/16 is designed for end users who link their remote minicomputers to a large central computer, Interdata said.

Industrial users will be able to establish hierarchical distributed systems while scientific users will be able to provide system access to remote terminals with the software, according to the firm.

"Itam/16 is a subset of Itam/32 which was introduced earlier for users of 32-bit Interdata computers," Interdata said.

The software is said to provide a device-independent level of communications which accesses remote devices as though they were directly attached peripherals. This level not only supports asynchronous terminals such as teletypewriters and CRTs, but also includes a Remote Job Entry (RJE) package.

The RJE package allows user to emulate an IBM Model 2780 or 3780 remote terminal. It may also be configured for Interdata processor-to-processor communications.

Itam/16 users are able to read and write to remote terminals from their processors as though they were local peripherals. The user deals only with the data concerning his application because Itam handles line types, protocols and recovery.

Itam is said to accomplish this by inserting or deleting necessary control characters, recognizing and transmitting line control sequences and employing necessary error-recovery procedures.

The Itam is reentrant and reportedly can be used in multiple line configurations.

The software costs $1,200 for immediate delivery from Crescent Place, 07757.



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PUT MORE "TEETH" IN YOUR DECWRITER . . .
ADD A LOW-COST, SINGLE OR DUAL CASSETTE FOR–

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Singer/MMCI Terminal System Features 4,800 Bit/Sec Speed

ORANGE, Calif. -- Singer/M&M Computer Industries, Inc. (MMCI) has an intelligent remote batch terminal system that communicates at speeds up to 4,800 bit/sec with a 300 card/min reader and 300 line/min printer.

Designated the System 525, it is said to cost approximately $115 less than similar systems on a monthly rental basis.

Other available peripherals include a teletypewriter, a CRT, a card punch and interfaces for slower card punches.

The System 525 emulates the Burroughs DCi100, Univac 1004, Control Data Corp. UT200, Honeywell 115 and IBM 2700, 3780 and 360/25 Hasp. Standalone features include card reader-to-card punch and print utilities.

The basic System 525 with an intelligent processer, 300 card/min reader, 300 line/min 132-column printer and maintenance rents for $165/mo on a one-year lease.

Three-year leases are offered at $550/mo including maintenance. Purchase price is $19,990. Singer-MMCI is at 220i N. Glasseii St., 92665.

Development System Combines CRT, Micro

OLATHE, Kan. -- Technical Communications, Inc. has a microprocessor development system that provides a communications terminal and microprocessor module in one unit.

Configured around the Fairchild F-8 microprocessor, the M-8 Educator features a 53-key terminal, 31-line CRT, i10 bit/sec teletypewriter-compatibie serial 1/O, 300 bit/sec teletypewriter-compatible serial 1/O and composite video output for use with an optional remote monitor, according to the company.

Options for the system include a firmware-resident assembler, cassette tape storage module and programmable read-only memory programmer, the firm said.

The basic system costs $1,795 and is available from Box 306, 66061.

Serial Data Interface Available From Victor

FRAMINGHAM, Mass. -- A serial data interface that has the capability of receiving serial information over communications lines and directly storing the information or transmitting it serially on- or off-line has been introduced by Victor Associates.

The Model VA1 i01 was designed to be an interface between serial data sources and paper tape punches or compatible parallel data storage equipment.

It can also be used to interface paper tape readers or compatible parallel stored-data transmission equipment with serial data receivers.

All options are available in the three mounting configurations, Victor noted.

Transmission rates are 110-, i50-, 300-, 1,200-, 2,400-, 4,800- and 9,600-bit/sec for incrementai tape readers. Receive rates are 110-, 300-, 600- and 1,200-bit/sec for tape punches.

An internal clock allows individually selectable rates for receive and transmit.

The VA1 10i is designed so various modes of operation can be selected. The unit is priced from $500 to $1,100 depending on options, Victor said from 1400 Worcester Road, 01701.

DEC Course in Package Focuses on Communications

MAYNARD, Mass. -- Digital Equipment Corp. has designed a self-paced audiovisual course called "Introduction to Data Communications Concepts."

The course is said to provide generic data communications training for students with only a basic knowledge of computers. It can be used in employee training as well as in vocational and technical schools with computer science curricula, DEC said.

The package includes nine modules on trends, system types, basic concepts, channel concepts, common carriers, terminal equipment, error handling, line control and software.

Audio/filmstrip cartridges come with 10 sets of student workbooks and one set of reference materials.

The package is offered without a playback unit for $1,800 from DEC's Educational Services Department here in Maynard, 01754.

Terminal From Ann Arbor Features Editing Capabilities

ANN ARBOR, Mich. -- Ann Arbor Terminals, Inc. has introduced a terminal which it said was designed to satisfy data-editing requirements.

The K2480D batch transmit terminal has an editing option that allows the user to insert or delete not only a complete line of text, but also a line fragment from cursor position to end of line, according to the company.

This characteristic allows rapid text editing with a minimum of keystrokes, the company said.

Wraparound Feature

A text wraparound feature allows the operator to open the text at any point and insert an arbitrary amount of additional data, a spokesman noted.

Users can obtain the data-editing capability by adding the option to Ann Arbor terminals already equipped with the Batch Transmit option.

The terminal's editing functions are insert/delete character, insert/delete to end of line, erase to end of line and erase to end of page, Ann Arbor said.

Ascii Output

Output is Ascii-coded, asynchronous serial data with data rates up to 9,600 bit/sec. A 79-key, alphanumeric keyboard is supplied; keyboard codes are upper-case Ascii with 7-bit parallel TTL input.

The K2480D with the editing option and keyboard is $1,795. OEM and quantity discounts are available, with delivery in 90 days, the company said from 6107 Jackson Road, 48103.

Multiplexer Has 16-Bit Micro

ANAHEIM, Calif. – The Remote Intelligent Multiplexer (RIM), which incorporates a 16-bit microcomputer and is aimed at distributed data acquisition and control in processing industries, has been introduced by General Automation, Inc. (GA).

The RIM provides enhanced computational power, capabilities for expanding I/O in the field, communications backup in the event of failure, independence of control and data logging from operation of a host computer and local display of data for startup and maintenance purposes, according to a GA spokesman.

The RIM can accommodate all communications over four twisted-pair telephone-grade cables, a feature which provides savings in cabling costs for processing plants, he added.

In addition, the RIM provides data acquisition and processing power and interrupt servicing at the process, reducing the communications load on a supervisory computer, the company said.

The basic RIM, priced at $5,500, includes a GA-16/220 microcomputer with 8K words of semiconductor memory and a high-speed communications controller which is said to be IBM Synchronous Data Link Control (SDLC) compatible for point-to-point or multidrop networks, GA said.

It also includes a 5-½-in. CRT/keyboard console, a read-only memory loader for exchanging programs and data with a remote host computer and provision for the addition of a wide range of standard I/O interface cards, the company sdded.

The RIM can be expanded to support all standard GA-16/220 software and operating systems, GA said from 1055 S. East St., 92805.

DEC Adds Six Keyboard Options For LA36 Decwriter II Printer

MARLBOROUGH, Mass. – Digital Equipment Corp. has added six options to the LA36 Decwriter II matrix terminal printer to enhance forms handling and communications capabilities, the company said.

Paper-feeding and formatting options are said to increase the efficiency of terminal performance.

A "top-of-form" option permits the user to choose any of 12 switch-selectable positions to begin printing of an initial line, DEC said.

Other options give the user up to 132 horizontal and vertical tabs per form, signal end-of-paper or paper-jam conditions and initiate automatic line feed after receipt of a carriage return signal, the firm added.

The fifth option available allows both APL and ASI characters to be selected by means of a keyboard switch, DEC said.

The remaining option is an automatic answering feature, protected by a time-disconnect feature, that permits the terminal to respond to incoming calls.

The six options are controlled by several switches and LED indicators on the keyboard. They are available immediately on the LA36 Decwriter II and the LA35 Decwriter II, the receive-only version of the LA36, with the exception of the paper out feature, which is standard on the LA35, DEC's Components Group said from One Iron Way, 01752.

Now there's a family of distributed data entry and processing systems that you can tailor to the requirements of your remote sites.

If you've considered the advantages of distributed data entry and processing, you've probably discovered a sad truth:

A system that's fine for Poughkeepsie might be a washout in DesMoines.

Different sites have different needs. From remote data entry, to communications, to remote inquiry and response, to on-site report and forms generation.

And to overwhelm a small branch with high-powered equipment is just as bad as under-equipping a large one.

To match each of your branches with exactly the right equipment, in both hardware and software, there's only one terminal manufacturer to turn to. Us.

We're as flexible as you are.

Using our Sycor Models 340, 350 and 440, and their wide range of peripheral equipment, you can pinpoint capability to site requirements and price.

Our Model 350, for instance, might be just the ticket for your two-man operation in Des Moines. While a larger branch in Los Angeles might require the concurrent background processing capabilities of the Sycor 440.

And, while each of the three terminal systems has its own unique capabilities, they all work together in a remote processing network.

Each, for example, can be programmed with our high-level, easy-to-use TAL language. And, they not only talk to your CPU, but to each other.

And that means flexibility.

Should the requirements of one location change, our systems can change with them. You can switch terminal models without changing programs, or even retraining operators.

The Model 340.

For smaller office situations that call for data entry, you'll find our Model 340 the low-cost intelligent answer.

No matter which of its hundreds of applications you use it for—like order entry, payroll and accounts payable—you're assured of virtually error-free data every time. Because operator errors are pointed out immediately for on-the-spot correction.

And, its 8k bytes of programmable memory and capabilities like customized field validation, conditional data entry and arithmetic operations, mean the Model 340 goes even further in providing for needs you might not even have anticipated when you first got it.

The Model 350.

If you need the advantages of random accessibility, look into the Model 350. The 500,000 "fill-in-the-blanks" characters on its exclusive dual flexible disks let you store customer, product/price and salesman files right at the source.

And, with its 16k bytes of programmable memory, the Model 350 not only retrieves data, but maintains and updates files—and even generates reports.

Just key in a customer number and you get all the pertinent data: name, address and billing information. That means reduced keystrokes, improved accuracy and big savings.

The Sycor 440 System.

When you need more than just data entry, look into our new Sycor 440. With a disk storage capacity of up to 10 million characters and the use of up to eight separate terminals, you can do data entry and inquiry/response concurrent with background processing.

Our 440 system lets you share and access files locally, reducing communication line costs and investments in central CPU resources.

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Informer Has Printer For RS-232 Terminals

LOS ANGELES – Informer, Inc. has introduced a pollable, hard-copy printer terminal designed for use with terminals having RS-232 communication interfsces.

Informer's Model H can print 32 char./line in a 5 by 7 dot matrix at a speed of 40 char./sec with 10- or 12 char./in., the company said.

Transmission speed options of 110-, 150-, 300-, 600-, 1,200-, 4,800- or 9,600 bit/sec are switch-selectable, a spokesman added.

Variable Formats

An internal strap permits selection of 7- or 8-bit character lengths, one or two stop bits and odd or even parity, Informer said.

The Model H uses the same line discipline as the Informer Model 302 terminal controller. Dual connectors and drivers facilitate daisy-chaining, the spokesman said.

Models are available for 3-3/4-in.-wide paper, with friction or sprocket feed.

The power requirement for the Model H is 1 amp at 117 Vac, 60 Hz, with different power options available.

The Model H costs $995 in quantities of five and is available in 60 days, Informer said from 2218 Cotner Ave., 90064.

GE Offering Lease Plans For Terminet 30 Printer

WAYNESBORO, Va. – General Electric Co.'s (GE) Data Communication Products Department is offering various lease plans for its Terminet 30 matrix teleprinter.

An 80-column keyboard send/receive (KSR) model is $88/mo on a one-year lease, including maintenance, GE said.

The standard teleprinter includes adjustable pin feed, upper- and lower-case printing, numeric cluster, an RS-232 data set control interface and parity error detection, the company said.

In addition to the KSR model, GE is also offering on lease a send/receive model at $83/mo. Both magnetic tape and paper tape versions of the teleprinter are available.

Lower rates are available for longer term leases of two-, three-, four- and five-year periods, GE said. The printer may also be leased on a month to month contract, the division added from its headquarters here in Waynesboro, 22980.

Digicom Adds Coupler

CAMPBELL, Calif. – Digicom Data Products, Inc. has introduced the AC-312 model acoustic coupler which operates at 1,200 bit/sec with an optional 300 bit/sec capability.

The device is Bell 202-compatible and also includes 5 bit/sec reverse channel capability.

The AC-312 costs $625 from Digicom at Suite E, 280 E. Hamilton Ave., 95008.

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More Users Sit Tight

1975: A Year When 'Newer' No Longer Meant 'Better'

By Patrick Ward
Of the CW Staff

This may have been the year when users decided that "newer" isn't necessarily "better" in the world of DP.

The forbidding economy and disillusionment with the cost/performance ratio of IBM's 370 line drove up demand for IBM 360s and other used computers, third-party lessors said.

Many customers were former 370 users who decided a 360 could handle their applications more economically, the lessors added.

In both Europe and the U.S., the pace of acceptance of technological innovation has slowed, thus extending the life cycle of computers, according to an *EDP Europa* report. Unstable economic conditions around the world are persuading users to hold onto their equipment, the report added.

Third-party lessors and independent peripheral suppliers backed up this trend by offering 3330-equivalent disks and "370" software on 360s, which blurred the distinction between the two IBM series.

Rumors About FS

Rumors spread that IBM's Future Systems (FS) had been either dropped or postponed until 1979 or 1980. Other sources speculated that FS or its successor would be a distributed-processing "traffic cop" that wouldn't replace the 370 at all.

IBM, Univac, Honeywell and Control Data Corp. concentrated on enhancing their large mainframes. The big machines they announced during the year were mostly variants of familiar models.

While the large processor area was fairly quiet in 1975, there was a spate of significant announcements in the disk drive, mass storage, printer and data entry areas.

IBM claimed its 3350 fixed disks offered a significantly better cost/storage ratio than its 3330. Independent suppliers showed their vitality by quickly announcing competitive drives.

CDC launched a competitor for IBM's 3850 mass storage system, and Information Storage System's (ISS) said it had one coming too.

IBM's 3800 laser printing device, which the vendor projected could save some typical 1403 users 30% of their printing costs, was one of the most novel technological announcements of the year.

The paper cost explosion had noticeably slowed by late 1974, but it served to heighten interest in computer-output microfilm in 1975.

This is one output alternative IBM has not yet blessed with a product of its own.

IBM did endorse the key-to-disk concept this year with its 3760 keystations, which makes the 3790 terminal system far more of a stand-alone key-entry system than it previously was.

CDC also joined the key-to-disk ranks this year with the announcement of its Cyberdata system.

Four-Phase Systems, Inc.'s Data IV/70 Version 3 distributed processing package emphasized a trend toward on-line entry, update and retrieval of data on key-to-disk systems.

Inforex's 1300 system illustrated a counter trend, the emergence of small, entry-level key-to-disk systems aimed at replacing small clusters of keypunches.

Burroughs Corp., NCR and Data 100 Corp. all brought out stand-alone, intelligent data entry devices, offering further competition to keypunches.

The Four-Phase Systems product tied into the much-heralded "distributed-processing" concept, in which machine intelligence in small computers or key-to-disk processors or "smart" terminals share work with larger machines.

The idea is to bring computing power out to the user to catch errors at the source, meet local information needs locally, remove central CPU overhead and cut communications costs with the mainframe.

The pros and cons of distributed processing provoked some of the liveliest debate in DP conferences this year.

While some observers speculated that groups of low-cost and increasingly powerful minicomputers could replace large-scale mainframes costing many times more, others rejoined that the need to coordinate both the machines and the people who run them was an important liability.

Review and Forecast

Memorex to Build 3350-Type System

SANTA CLARA, Calif. – Memorex Corp. has begun a development program to build a disk storage system compatible with IBM's 3350 fixed-disk subsystem.

The Memorex 3350-equivalent is planned "to meet or exceed the performance of the IBM system," a Memorex spokesman said.

Further details are as yet unavailable, the spokesman said.

Amdahl Arrives, Xerox Departs in '75

By Patrick Ward
Of the CW Staff

The past year brought a remarkable occurrence – a new vendor entering the mainframe arena. And the novelty was heightened by what is becoming a more familiar event – a vendor departing the mainframe scene.

Amdahl Corp., the new entry, offered a machine it said is 100% faster than a similarly priced IBM 370/168. The Amdahl 470V/6, moreover, is said to be software- and hardware-compatible with the 168, so users can keep their peripherals and avoid the cost of software conversion.

The firm "does not intend to build smaller CPUs, nor does it have any immediate plans to . . . sell peripherals or to challenge the de facto standard of IBM software," Eugene R. White, Amdahl president, said.

With at least two systems already accepted by users and at least three more on order, the Amdahl strategy seems to be working.

The next challenge facing Amdahl (and Japan's Fujitsu, which have provided both financial and technical support) is keeping up with the mainframe announcements coming from IBM and other vendors.

The company may or may not deviate from the path of IBM compatibility when IBM launches the "380," according to Gene Amdahl, founder of the firm bearing his name.

"It depends on whether we can do something better. We'll make that decision then," Amdahl said.

Xerox's decision to abandon its money-losing mainframe line last July undoubtedly caught some users by surprise.

Xerox users, like RCA and General Electric users before them, were left in confusion about where their hardware and software support was going to come from next.

A flurry of announcements followed from various companies offering to provide some of that support. At year's end, it appeared Honeywell field engineers would be servicing Xerox machines.

But for DPers of all types, Xerox's exit meant one less option, one less competitor in the computer industry.

User Installs 4M-Byte Memory on IBM 370/165

Special to Computerworld

MILWAUKEE, Wis. – A manufacturer here chose to extend the memory capacity of its IBM 370/165 from 3M bytes to 4M bytes rather than buy a new computer to handle its growing workload.

"It is less expensive to expand our capacity this way, allowing us to keep costs down for our customers," said Alan G. Brown, general manager of A.O. Smith Corp.'s Data Systems Division.

"Previously, when customers submitted extremely large and complex engineering programs, we had to run them at night when they would not hurt the service we were providing for all of the regular work," William Kenyon, the division's manager of computer operations, said.

"Now, even though customers are submitting these very large jobs many times during the day, the regular work has not been hurt; in fact, all service has improved significantly."

The modifications allow the division to process an average of 12 separate jobs simultaneously, compared with only nine previously, Kenyon said. "In addition, more memory is available for on-line work, enabling us to improve response time."

Control Data Corp. engineers extended the 370/165 memory through circuitry modifications.

The 370/165 was first installed at A.O. Smith's computer center here in May 1972 with 2M bytes of IBM core. It was upgraded to a 3M-byte system in October 1973 by replacing 1M byte of IBM core and adding 2M bytes of MOS memory purchased from CDC.

In January, A.O. Smith sold the remaining 1M byte of IBM core and purchased 2M bytes more of CDC memory. Between January and May, A.O. Smith ran only 3M bytes of the 4M bytes in-house, trying all combinations of 3M bytes on the system.

CDC engineers completed installation of the fourth 1M byte in June and turned it over to A.O. Smith for testing.

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At City Utilities Department

Microfilmed Billing Records Save $50,000/Year

By Patrick Ward
Of the CW Staff

RICHMOND, Va. – By producing its monthly billing registers on microfilm instead of on computer printouts, this city's Department of Public Utilities (DPU) saves about $50,000/year in paper costs, storage space and other billing expenses.

Additionally, the DPU staff can now answer customer service inquiries more quickly and easily, which pleases both customers and the DPU staff, William H. Hall Jr., controller of the department, said.

The DPU staff uses the microfilmed records of 21 different billing cycles, plus daily update listing on microfilm, to deal with customer questions on bills and payments, connects, disconnects, transfers and so on, Hall said.

The department produces the microfilm records on a Memorex Corp. 1600 computer-output microfilm (COM) recorder, which is on-line to the DPU's 768K IBM 370/145.

Awkward Volumes

Until the DPU switched to COM about three years ago, its staff had to contend with "awkward and cumbersome" billing registers made of bound printouts, Hall said.

"Retrieval time was slow, often causing irritation to customers, as well as to employees. Also storage costs were increasing."

With the microfilm cassettes the COM system produces, "we can now store four years of records in two file cabinets," Hall said. "Using paper, the records required a large storage room piled high with printouts," he said.

Retrieval of billing information has dropped from a minute or two to 10 to 15 seconds because of the switch from paper to microfilm records, Hall said.

Each cassette, the size of a 1-in. stack of punch cards, contains the meter readings and billings for about 5,000 to 7,000 customer accounts, equivalent to about 1,200 to 1,400 paper pages.

Twenty-one of these billing registers are produced each month, one for each of the DPU's billing cycles.

An update file containing all the latest connect, disconnect and payment transactions is included in a separate cassette.

Together, the billing register cassette and the daily update file cassette constitute a customer file that is up-to-date through late afternoon of the previous day.

'Practically On-Line'

For this department, Hall said, there is little advantage in changing over to an on-line CRT display system.

"An on-line CRT system costs a great deal more, and our microfilm cassette system is practically on-line anyway.

"Someone is going to have to do a lot of talking to make me want to spend the money to go on-line," Hall said.

"If we had satellite offices located over a large area, as some utilities have, then it might be advantageous to go on-line," he added.

After the microfilm is produced on the COM recorder it is developed in a tabletop unit that automatically threads and processes the complete daily billing register in about five minutes.

Another tabletop unit then duplicates the master file at 2,400 page/min. As many copies as required are made this way.

When needed, a hard-copy printer/viewer provides electrostatic copies of selected accounts. The DPU has a total of 45 Memorex viewers located throughout the department.

Before installing the Memorex on-line COM system, the department evaluated five competing microfilm systems.

Preferred Cartridges

At the time, in late 1972, the DPU decided microfiche sheets were more subject to damage and loss than cartridges. Another type of cartridge required rewinding to the beginning of a roll before removal from the viewer unlike the Memorex system.

With the COM printer available to other city departments, the police and health departments are considering using it for their own purposes.

The city plans to purchase the COM printer and terminate its rental arrangement in the very near future.

The throughput cost entailed in the department's 370/145 driving the COM recorder is less than what an equivalent amount of printer capacity would require, Hall said.

Both the reliability of the COM recorder and the maintenance service for it have been excellent, he concluded.

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On-Line Entry Reduces Problems in Parts Ordering

Special to Computerworld

PHILADELPHIA — A large wholesale automotive distributor here uses an on-line order entry and inventory control system to lessen some of the problems that commonly arise in this type of industry.

The on-line system has heiped reduce the amount of incorrect parts numbers submitted and mistakes in packing the parts the distributor ships, according to Herbert Lipton, president of Kay Automotive Co.

Other benefits include "much faster response to customer inquiries and orders, faster picking and a sizable reduction of lost orders," added Marvin Bogen, vice-president.

The heart of the system is a Univac 9400 real-time computer which is installed at the company's headquartera here.

The computer's 128K-byte memory is supplemented by five Univac 8414 disk units, each with a memory capacity of 29M bytes. The disk units store the parts and customer file information.

Also in the system are two high-speed printers, a card punch, a card reader and three keypunch units. The keypunch units are used to prepare punch cards for those orders received by mail.

Telephone Orders

Orders received over the telephone are now taken by operators using Univac Uniscope 100 CRT terminals linked to a Univac 9400 CPU.

The first task for the operator is to enter the customer's account number into the system for a credit cbeck. This is done by keying in the information on the keyboard. The display will then report to the operator via a message on tbe screen if the customer's credit ilmit has been reached, but it will not report tbe actual amount.

Assuming the credit cbeck is satisfied, the customer's various part numbers are entered into the system. The computer checks the inventory status of each part.

If the part numbers are suthentic and they are in stock, an order is entered and the inventory updated to reflect the withdrawal from stock.

Within a few seconds, the system prints out a picking order for the warehouse.

The order form indicates the zone of the warehouse where the part is stored and also states wbether the part is supplied in a box witb a larger quantity.

When a batch of orders have been printed on a continuous roll, they are separated and then taken to the warehouse for distribution to the pickers.

The order will be picked that evening and dellvered the next day to the customer. Some customers in the iocal area will pick up the parts ordered with their own vehicles from Kay's premises.

The transition to the on-line system, whicb became operational last fall, was a necessity for Kay because of tbe expansion of the business and the growing number of parts numbers handled — currently in excess of 120,000, Bogen said.

Planning the system took two years. The main goals were to automate as many functions as possible in the distribution process to lmprove customer service, remove human error wbenever possible and keep costs low.

Of the present total of 11 CRTs, six are in the "scope room" where the telephone orders enter into tbe system; two are on the counter, enabling clerks tbere to check parts svailability while the customer is waiting; two are used by the purchasing department; and the remaining one is kept in the executive office area for use by the company's top executives.

Information on any part number appears within a few seconds on a CRT screen. The information will show the totai number of a particular part in atock and also the quantity of that part already ordered that day (this is known as being in "Limbo" status).

To arrive at the true quantity of the part available for sale, the "Limbo" number must be deducted from the total stock number.

If tbe part number requested has been superseded by another number, the computer is programmed to present the latest number. It can also sbow the number for equivalent parts produced by other manufacturers if tbe particular part required is out of stock.

If one or more incorrect part numbers are inciuded on a iong order, the computer wili automatically spot them and list the bad numbers on a separate order form that can be checked out by the counter saies clerks.

In this way, there is no delsy to picking the remainder of the order listing correct part numbers.

Prevents Loss of Sales

One of the key features of the system is that many sales that might have been lost previousiy because of incorrectly submitted parts numbers can now be saved. Previously, there wasn't enough time to have the pickers attempt to match up the part needed with a bad number.

With the current system, the experienced sales clerks at the counter can go through the "bad numbers" and, in between other tasks, attempt to come up with the correct number by interrogating the computer through the display terminals.

Besides the real-time order entry and inventory status work, the Univac 9400 system performs a number of operations in a batch mode.

Billing is performed weekly. A daily report goes to the purchasing department listing parts out of stock. An automatic replenishment is triggered by the system when the quantity of a certain part in stock reaches a predetermined levei.

Other batch applications include sales statistics, commission reports, purchase inventory, sales and customer analyses and general accounting. Monthly reports include a montb-by-month record of usage and lost sales.

In Two Years

Key-to-Disk System Doubles Firm's Productivity

Special to Computerworld

CHATTANOOGA, Tenn. — Bancshares Dataline Corp. (BDC), a subsidiary of Hamilton Bancshares, Inc., has virtually doubled its data entry productivity in the last two years, due primarily to the impiementation of a key-to-disk system.

BDC has reduced its data entry staff from 25 peopie to 15 with no reduction in throughput, according to R.J. Denton, vice-president.

BDC provides accounting and DP services for 46 banks: i7 Bancshare banks, 28 correspondent banks and Hamilton National Bank here.

Among the applications processed are demand deposit, commercial loans, real estate, general ledger, factoring, bond accounting, savings, payrolls, stock transfer, financial services and Bank Americard.

Over 500,000 records (averaging 45 char/record) are processed each montb on the Entrex key-to-disk system alone.

In addition, BDC maintains a direct communications link with area centers in Nashville and Johnson City, Tenn. These area centers collect data from participant banks in tbeir regions and communicate it directly to BDC's mainframes.

BDC processes this sizable workload on two IBM 370/145s. Prior to Marcb 1973, all data entry was accompliahed using 22 IBM 029 and 129 units.

Using the keypunch units, DP personnel had noted several increasingly serious problems preventing optimum productivity:

- Escalating costs.
- Time-consuming operator error-correction process.
- High error rate, necessitating costly mainframe edit runs.
- Complex front-end balancing and preprocessing operations which delayed further processing.

Costs were increasing rapidly, due primarily to increased card costs, escalating paper prices and higher personnei salaries. Error correction on the keypunch equipment was a cumbersome and time-consuming process and the keypunch's lack of edit capabilities meant most errors were caught only in mainframe edit runs.

In addition, since overall DP volume was increasing, front-end balancing and preprocessing operations were delaying other processing.

To solve these problems and to achieve the increased throughput and tighter turnaround times needed to handle this rapidly growing workload, BDC began investigating other means of data entry.

After evaluation of several alternatives, BDC selected an Entrex System 480 with 11 keystations and a line printer. The system was installed early in March 1973.

Immediate results of key-to-disk implementation included the elimination of card costs on converted applications, as well as a significant reduction in tbe operator error rate, due to the simplicity of the system and its error-detection capabilities.

Mainframe edit run error faiiouts were reduced and the average job turnaround time wss improved by 25%. Denton attributed these savings to two major factors — a more efficient data flow and the buman engineering features incorporated in key-to-disk system design.

Data from the source documents is entered on tbe key-to-disk equipment; batch balancing and front-end preprocessing are also performed on the Entrex system, concurrent with data entry. From the key-to-disk system, data is output onto magnetic tape for transfer to the mainframe. The finai mainframe output is in the form of either hard-copy or microfiche records for member banks.

Data Flow Streamlined

An important key to BDC's data flow is the fact that thu key-to-disk system accomplished many functions simultaneously. For exampie, as data is being entered, the system balances and edits that data, indicating our-of-balance batches where applicable.

Concurrent with this entry/edit/balance function, mailing lists can be updated, labels printed or tapes prepared for the mainframe. Thus, overlapping operations simplify data flow and improve turnaround time.

Concurrent entry and verification capabilities have significantly decreased keying time, since more than one operator can work on the same batch simultaneously. Thus, while one operator is entering a new batch, another operator can already be performing the necessary verification on that batch.

Due to extensive use of the batch balancing and conditional verification features of the system, manual verification has been totally eliminated in some areas and is now performed on an exception basis oniy.

Repetitive or calculable data is simply generated by the system through output reformatting and data generation programs, significantly reducing keystrokes and contributing to data accuracy.

Most operator problems and/or decisions have been anticipated in system programming, with simple English error messages displayed on the CRT to imform the operator of the exact error or problem, as well as possible alternatives.

Operator Statistica Feature

The Operator Statistics feature is utilized by BDC to stimulate operator productivity, as well as to help supervisors plan time schedules.

System-generated statistics highlight the operators' strongest and weakest applications.

BDC DP personnel then utilize this information for job scheduling.

More productive scheduling in this fashion has helped BDC process over 500,000 record/mo using fewer personnel than with previous data entry equipment.

The key-to-disk system is also used to update customer lists and print mailing labels. A file of customer information is maintained on magnetic tape. At periodic intervals, this data is read onto disk and updated. Labels are then printed on the Entrex line printer, and an updated tape is created and stored until the next mailing.

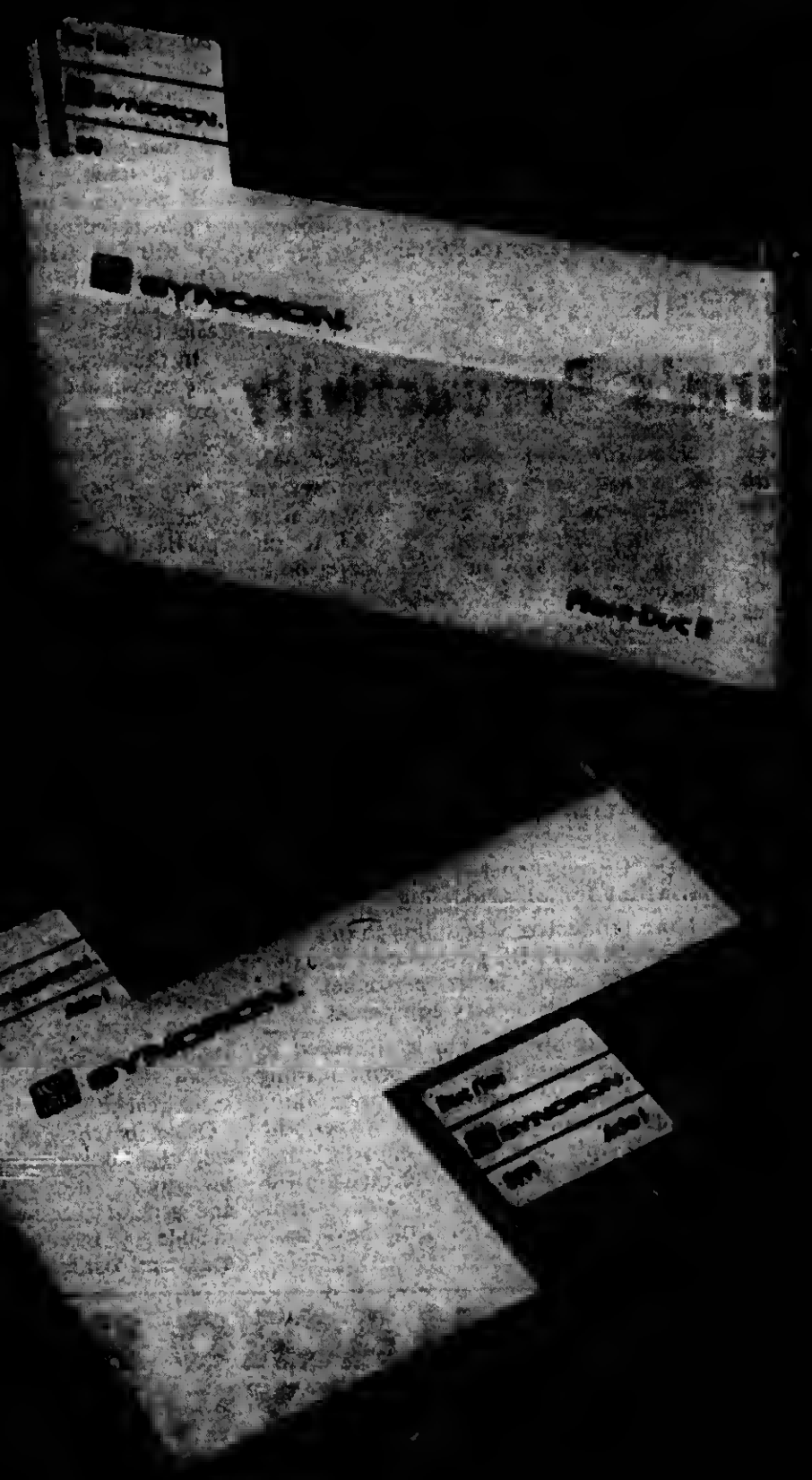
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From Micros to Maxis

Rapid Growth at Top and Bottom of Range Marks Year

By Esther Surden
And E. Drake Lundell, Jr.
Of the CW Staff

The minicomputer explosion continued throughout 1975 with rapid growth both at the top end of the minicomputer category through megaminis and at the bottom end of the listing with fast development of microcomputers.

More and more the higher end of the minicomputer classification saw the development of larger systems with full complements of software, which began to interest users who could foresee replacing more traditional mainframes with either single or multiple mini units.

At the lower end of the line, microprocessors began moving into some traditional mini areas, supplying the processing power that OEMs needed to build into their other products.

Possibily the revolution at the lower end of the line saw the greatest number of developments and the most rapid erosion in prices. The extension at the upper end, however, provided more choice and opportunity for end users willing to think small or distribute their data processing load throughout an organization.

And this impetus to the distribution of data processing may well turn out to be the most significant in the long run for the typical end user who has, until now been forced into centralizing his operation around a large mainfram to gain economies of scale.

Review and Forecast

Large Offerings

The year's large system offerings began with the introduction of the Systems Engineering Laboratories SEL 32/55, a machine with 32-bit words and fast floating-point hardware. After that came the Digital Equipment Corp. PDP-11/70 with 32-bit internal data paths.

In March, Interdata's 8/32, billed as four to six times more powerful than the company's 7/32 mini, entered the large system market and was followed by Varian Data Machines V75 at the top of the V70 line.

DEC scored again in April with the XVM systems that greatly expanded the PDP-15 line. The XVMs were said to have a program size capacity four times greater than the PDP-15s and 30% faster execution times.

Harris brought out six packaged computer systems in May. The top of the line this time was the S220, suited, the company said, for multiprocessing applications. In October Harris would introduce the Slash 7 series, billing it as a 24-bit midicomputer.

Digital Computer Controls' (DCC) June offering was a line of minicomputers with MOS memories. The top of the line was the DCC-616, said to feature multibank/multiported memories for the first time in the mini industry.

In October General Automation (GA) introduced its 16-bit "maxicomputer," the 16/440, along with a line extending from microcomputers on up. The 16/440 was described as a "systems programmers machine".

And DEC capped the year by introducing its Super 8 that added a floating-point processor to the PDP-8/A minicomputer.

Mid-Scale Minis

Mid-scale minis were also introduced this year. The SEL 32/50, Harris S100 and S210 packaged systems, DCC 216, 316 and 416 and GA 16/330 minis were announced as part of series that included large-scale systems, allowing the users to upgrade within a series.

In October Data General expanded its line of OEM minis with the introduction of the Nova 3 machines that ranged in size from 4K to 128K and were available with core or semiconductor memories.

The Interdata 6/16, at the bottom of the company's 16-bit mini line, was said to be 30% faster than the comparable 7/16.

The IBM System/32 small business system capped January. DEC introduced Datasystems based on the PDP-8/A and, in March, Data General announced the Eclipse C/300 for dedicated on-line operations within end-user departments of Fortune 500 Companies, the firm said.

The Burroughs L9000 series, introduced in June, was a series of small business machines said to provide double the

(Continued on Page 34)

Interdata Adds Communications, I/O Capabilities to 32-Bit Line

By Esther Surden
Of the CW Staff

OCEANPORT, N.J. – The I/O and communications capabilities of Interdata's 32-bit mini line have been extended through the introduction of Memory Access Multiplexers (MAM), the firm said.

Up to 63 high-speed character-interrupting devices such as magnetic tape drives, CRTs and printers may be connected to each MAM option. Up to seven MAMs may be added to a system.

System throughput is said to be 195,000 char./sec, an increase of some 600%, compared with the 30,000 char./sec rate for present Interdata minis, a spokesman said. The MAM is meant to enhance the 7/32 and 8/32, but not to duplicate an upgrade, he added.

For half-word, 16-bit transmissions, throughput via the MAM multiplexer would be 370,000 char./sec, he continued.

The number of devices that can be hooked up to the MAM is limited to the number of discrete addresses necessary, a spokesman said. A communications modem operating in full-duplex would require two discrete addresses using two of the 63 available addresses.

Two printed circuit boards comprise the MAM, which is connected to both the system memory bus and the system I/O bus. In turn the MAM generates its own bus, the spokesman said. The character-interrupting devices the MAM accommodates are connected to the MAM bus.

The standard controlier the customer formerly used on the system I/O bus can be used on the MAM bus, according to Interdata. The MAM bus is functionally and electrically identical to the standard bus, the company said.

Special character recognition for binary synchronous data may be performed by MAM under program control for each device. This indicates to the programmer when to change modes, when to terminate and how many characters to read before termination, Interdata said.

The MAM has three sections, according to Interdata.

MAM device control blocks buffer the data, contain the main memory pointers, the character count and a status mask of the particular device.

The processor-interrupt queue stores and identifies up to 255 interrupts until they are cleared by the processor. The read-only memory (ROM) section performs special character recognition, allowing either Ebcdic, Ascii, six-bit or customer-specified code to be selected.

The MAM costs $4,500 plus an individually established installation charge dependent on the user's configuration and is available immediately, Interdata said.

Diablo Disk Drive Series Priced Under $2,500

By E. Drake Lundell Jr.
Of the CW Staff

SAN FRANCISCO – Diablo Systems, Inc. has introduced a family of disk drives for small- and medium-scale computer systems it said represents a price/performance breakthrough.

The Series 400 presently consists of eight separate, compatible drives with capacities ranging from 13.3M bytes to 53.3M bytes and is priced from under $2,500 to $3,600 in OEM quantities. Single-unit quantities, however, would be 60% higher, the firm said.

All of the units feature a transfer rate of 5.24 Mbit/sec, and average seek times of around 40 msec, the firm said.

The devices feature a "unique" dual-head-positioning mechanism that is based on an inertial actuator capable of independently moving two head positioners per disk drive.

This allows a user to be seeking with one head positioner at the same time that the other positioner is being used for writing or reading, the firm said.

The units all have the same power requirements and use both removable- and fixed-disk packs. The removable packs are either a 2315-type cartridge in the front-load models or a 5440-type cartridge in the top-loading units, while the fixed disks are 75-mil (3330-type) media, the firm said.

The Model 410 (which, as with all units, comes as either a top-loading or front-loading unit) has a capacity of 13.3M bytes and has one removable disk (two recording surfaces) on the upper positioner and no fixed disks on the lower positioner.

The Model 411 has a capacity of 26.6M bytes with one removable disk on the upper position and one fixed disk (two recording surfaces) on the lower positioner.

The Model 12, with a capacity of 40M bytes has one removable disk and two fixed disks (four recording surfaces) on the lower positioner; the top-of-the-line 413 has one removable disk on the upper level and three fixed disks with six recording surfaces on the lower for a total capacity of 53.3M bytes.

All units have a built-in microprocessor that provides a diagnostic capability permitting the data channel and actuator channel to be stressed using data on each data pack. Further, the service engineer

(Continued on Page 34)

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Based on Minicomputer

Ames 'Guiding Light' Tracks Files Circulating in Firms

SOMERVILLE, Mass. – The Guiding Light system from Ames Color-File Corp. uses bar coding and light pens to keep track of file folders and other items as they move through an organization.

The system can be configured as a stand-alone unit built around Digital Equipment Corp.'s PDP-11/05 minicomputer or interfaced to a user's mainframe, a spokesman said.

Each record is marked with a unique bar-coded number. A request for a record can be entered into the system through keyboards at remote locations throughout the facility.

Location of Record

The location of the record is indicated on a CRT and a request slip is printed out wherever the record is located. The request is posted in the computer, together with time and date.

When the record is removed from the file, the person responsible for logging out records sets his light pen to the log-out function and strokes the pen across the bar code. The light pen reads the bar code and the transaction is posted in the computer.

When the record is delivered to the requestor, he acknowledges receipt by stroking his light pen across the bar code. Each light pen terminal is self-identifying to the computer, Ames said.

If the record is forwarded to another location, that transaction is "wanded" to the computer through light pens. The computer automatically posts a time and date to each wanded transaction, thus maintaining an up-to-the-minute accounting of the location of all records in the system, the company said.

Exception Report

Every hour the system prints out an exception report of all records requested and/or logged out but not acknowledged by the requestor. The report is used by the department tracer clerk to identify the problem.

Ames will either sell the user precoded file folders or a device that will allow the user to mark his own folders.

Although originally designed for hospital use, the system can be adapted to any operation that presents a need to track items in a high-volume, high-traffic inventory, Ames said.

Application areas could include trust department records and clipping coupons in the banking industry; claims files in the insurance industry; and unit dosage systems in the pharmaceutical industry.

The system can also track reels and cans of film in the processing and distribution of motion pictures and parts and components in a manufacturing process, the firm said.

The terminals with light pens cost $1,460 each and the system's multiplexer decoder, which can support up to 16 terminals, costs $5,860. Ames is at 12 Park St.. 02143.

Growth at Top, Bottom Marks '75 Mini Mart

(Continued from Page 33)

throughput of previous L series models. And NCR's September entries, the NCR 399-113 and 399-114, were top-of-the-line models for small- and medium-sized businesses.

IBM's 5100 was not introduced until October. The packaged business system could support both Basic and APL. Tektronix then countered with its personal computer with Basic to compete with the 5100.

The move to micros began with DEC's LSI-11 in February. The system was said to execute the 400-plus instruction set of the PDP-11/40.

The GA 16/220 was a micro at the bottom of a line that extended to the "maxi-computer".

The Texas Instruments 9900 series with microprocessor-based minis came out in October. That same month, the Hypercube by IMS Associates, Inc., combined Intel 8080s into an array billed as being able to give large-system users high-processing capability at low cost.

The year came full circle – from micros to minis to midis, then back again to micros hooked together to look like midis.

Diablo Disk Drives Priced Under $2,500

(Continued from Page 33)

can plug in memory and run diagnostic programs to isolate problems down to the functional block in the circuit board, the firm said.

The microprocessor is also used to ensure compatibility between the members of the family without electronic changes.

The unit also offers users a servo track-following positioning system where servo data is prerecorded on each data track and interspersed in the unused sectors between data fields. The recording head aligns itself with this servo data.

Because of this, no special disk pack is needed for head alignment on the system.

The Series 400 uses one AC power source to power both actuators, although they operate independently, and to power one generator power supply, the firm said.

Micro Has Debugger/Monitor

LOS ALTOS, Calif. – Microcomputer Associates, Inc. has a microcomputer with an on-board debugger/monitor.

The basic Jolt card includes an 8-bit CPU that can directly address 65K of memory, two index registers, 58 instructions with 11 addressing modes, two interrupts and both single-step and address-halt capability.

The system costs $249 in kit form and $348 assembled from Pehaco Corp., P. O. Box 1436, 94022.

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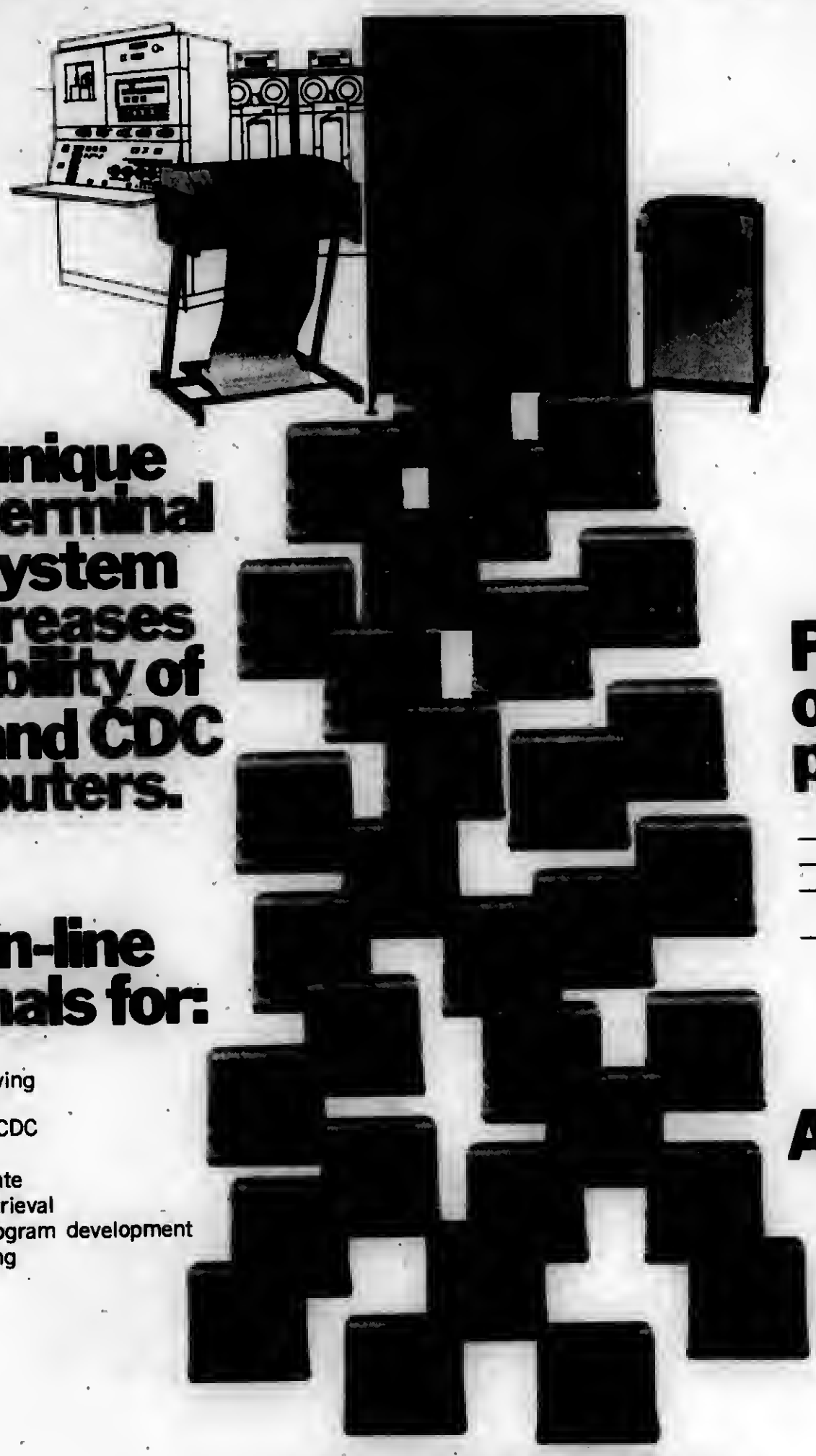
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Batch System Presented Problems

On-Line Order Entry Steps Up Book Distributor's Service

SECAUCUS, N.J. – "If we can make four or five sales to a store between September and November instead of one, we are in clover."

What Leon Amiel, president of Amiel Book Distributors, Inc., meant is that the money is made in repeat business. Amiel Book, which deals in remainders and its own illustrated books, credits titles and service for repeat sales – aside from a promotional push and possibly some other incentives, there is not much a distributor can do about a slow-moving title.

But service is something else again.

Thus, when the company recently reduced delivery time by at least 50%, the target was repeat business. Where it used to take three to four weeks to ship an order, turnaround has been cut to one to two.

In addition, relatively small rush orders (up to 15 line items) can be shuttled through the office and out to the warehouse in 15 minutes. Previously, getting an order to the warehouse in less than a day was difficult at best.

Change of Method

The speed-up resulted from a change in the way Amiel Book processes an order. Using an NCR Spirit on-line order entry system, Amiel Book now enters orders directly. As a result, the paperwork is completed sooner and that, in turn, steps up warehouse picking.

At the same time, "reserve file" inventories are updated. The reserve file is a computer record of some 5,000 titles and 3,000 prints supposedly in stock at the moment.

While the running totals may not be absolutely accurate because of cash transactions and other activity not posted until later, the reserve file is close enough at the time for management purposes.

The system, which features an NCR Century 8200 minicomputer, costs $15,000- to $20,000/year less than the previous batch processing system. And that includes on-line capabilities.

The company, whose origin dates back about 50 years, sells to approximately 10,000 libraries and bookstores across the country.

For all but about a year, Amiel Book was based in New York City, where orders were manually typed and priced. Title descriptions were written out in full.

To further complicate matters and add to the delay, the office was in one location and the warehouse in another. So, besides the tedious paperwork process, there was the problem of moving documents across town.

A batch system was installed but its inventory reporting presented some problems – records were not updated until after the orders were shipped and stock status summaries were one to two weeks after the fact.

The strength of a batch system is its capacity to process a lot of work fast. That, according to Amiel Book, was too much power for a company its size and scope.

On the other hand, an on-line system makes "the best people responsible for the work," Amiel said. Orders are entered into the computer by order clerks and accounts receivable transactions are posted by financial people. The idea is to fix responsibility with personnel having the expertise to shoulder it.



NCR Spirit system is used at Amiel.

Mini-Based System To Print Mail Labels

ST. LOUIS, Mo. – A minicomputer-based system is under development here in an effort to help speed up the often sluggish mail service.

The system being developed by the Electronics and Space Division of Emerson Electric Co. for the U.S. Postal Service is essentially a printing system which has the capability of producing a yearly total of 8 billion labels and slips used to attach to mail bags and bundles of letters with a common destination.

The labels and slips will indicate information such as origin, destination, date and type codes for delivery.

The system will include 11 Varian Data Machines 620L computers, performing three basic functions – production control, file maintenance and print-line control.

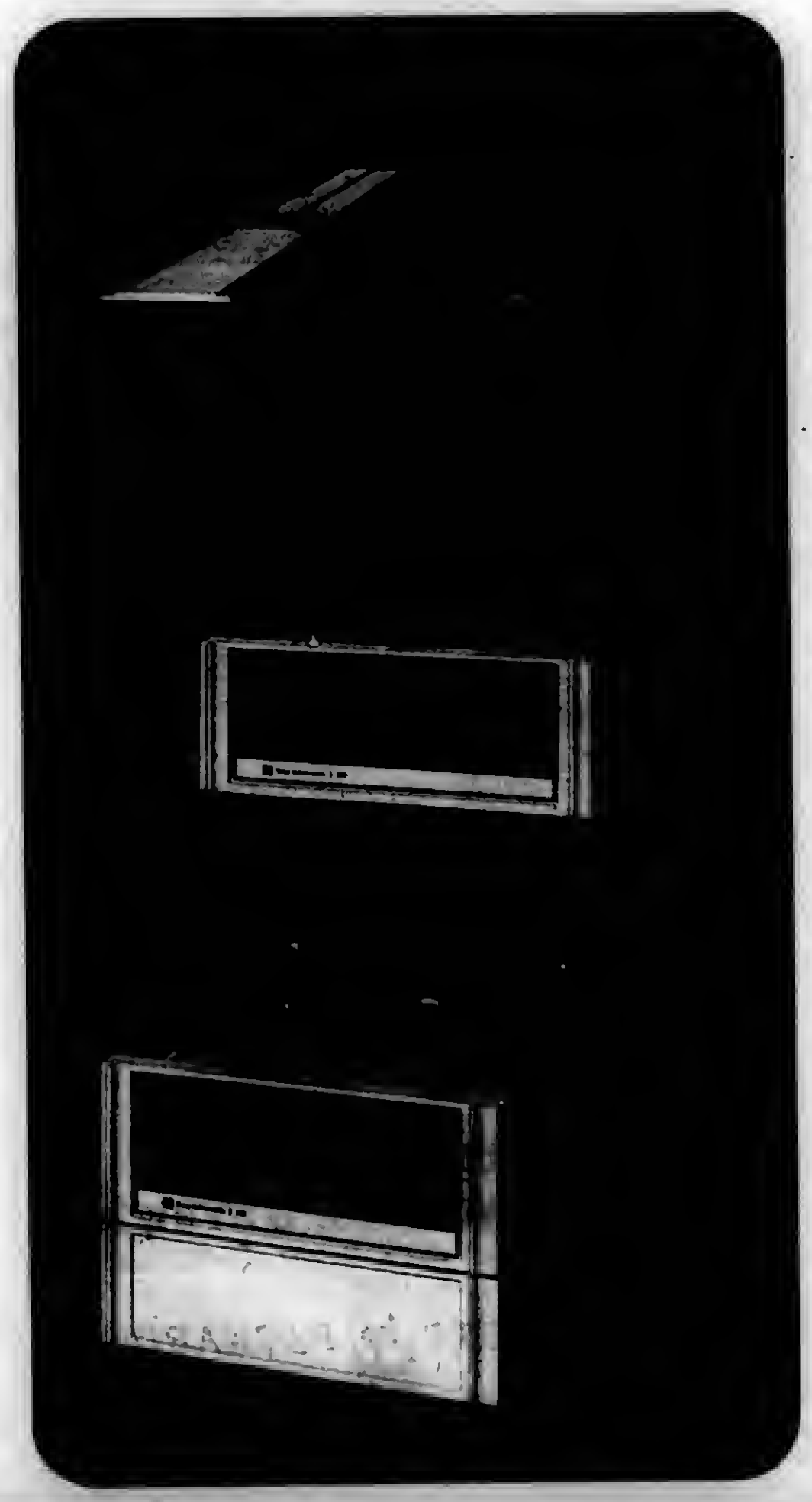
With the system, the post office's computerized printing plant for labels and slips will produce a supply for every post office based on its needs.

The necessary data will be stored on magnetic tape and used to produce two-week supplies for each order.

The file computer, also a 620L, will be used to update the list of several million different origins and destinations involved. The 620L computer in charge of production will parcel out the printing workloads taking into account factors such as priorities, availability of lines for production and rescheduling.

It will adjust production to account for malfunctions and put the computer file on-line for the more important function of production should a production or print-line computer fail. The print-line computer will control the actual flow of paper through the printing and cutting processes.

TI's 990 computer family...



The TI concept of what a computer family should be goes beyond producing the most reliable and cost-effective hardware around. To us, that's basic. The extra dimension is usability, and this means software and support.

The TI 990 computer family has all the ingredients. We make every member of the family ourselves, and we make them all software compatible from bottom to top. We also make them the most economical on the market and back them with total TI support, both before and after the sale.

Complete software libraries, as well as memory-resident and disc-based operating systems, support real-time and multi-tasking operations. We offer FORTRAN, COBOL and BASIC languages . . . program development packages with utilities . . . stand-alone software development systems. And we offer cross-support on timesharing networks so you can begin early development of your own applications programs.

The TMS 9900 Microprocessor . . . The Technology Leader

The advanced capabilities of the 990 family result from a TI milestone in MOS technology . . . the TMS 9900 single-chip, 16-bit microprocessor. It's at the heart of the 990 family, with a unique design that allows for data manipulation that's been hard to achieve with earlier devices. With its high-speed interrupt capability and versatile set of instructions, the TMS 9900 delivers the kind of computing power you'd expect from a 16-bit TTL computer. And it's the best microprocessor going for terminals, machine monitoring and control, and many other applications.

Because the TMS 9900 provides the instruction set for the new 990/4 microcomputer and 990/10 minicomputer, software developed for the low-end computers will be compatible with the higher

Mini Expected to Cut Cable Testing Cost

ST. PAUL, Minn. – A minicomputer system used to test newly developed telephone cable connectors is expected to reduce test time and manpower costs while increasing test accuracy, according to Ralph F. Wickenberg, laboratory supervisor in the Telcomm Products Department of the 3M Co. here.

The real-time Hewlett-Packard (HP) 9602 scientific measurement and control system, recently installed, will administer the thousands of separate tests necessary during connector design development.

Using an HP digital interface multiprogrammer, the mini will step through the test sequence for each connection, applying precise currents, taking voltage drop readings and recording them on magnetic tape, calculating resistance and printing out the results.

The connectors are subjected to accelerated environmental aging for periods of 30 to 170 days to simulate the 40-year service demanded for telephone system applications. Aging is accelerated by high temperature and humidity, temperature shock and cycling.

Other samples are exposed to salt water spray, vibration, current cycling and other adverse conditions.

The resistance change that takes place as a result of these conditions is a measure of connection reliability. In terms of an actual telephone conversation, high or unstable resistances could result in excessive noise, static or a lost connection.

Time-Consuming Manually

The manual method, now obsolete, was tedious and time-consuming. It entailed manual operation of electronic equipment to pass the current through the connector on the circuit board – which may contain a single modular connector handling 25 pairs of wires or 100 discrete two-wire connectors – and to measure with exacting precision the voltage drop.

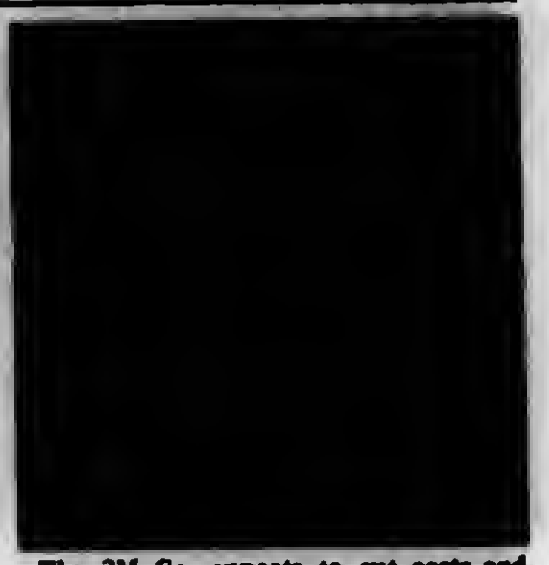
The voltage drop was recorded on a printed paper tape used to make cards for processing on the company's IBM system. It often took about two days before the results were back, Wickenberg said.

The HP system will enable the division to have its results in real-time with fewer measurement errors, eliminating human errors in transcribing data onto cards and shortening the time for the tests. This will allow the company to bring new connectors to market sooner.

Could Supply Entire System

HP was selected for the task of automating the division's testing, Wickenberg said, because HP could supply the entire system, including all the peripherals and electronic measuring equipment needed.

"When you mix up the companies who supply parts of a system," Wickenberg explained, "you may have difficulty locating the faulty element when you have a system problem. This way, we only have to call one phone number if trouble should develop."



The 3M Co. expects to cut costs and time spent in testing new connector designs with a minicomputer system.

The HP 9602 includes a 2100 processor with 16K memory as well as real-time-executive operating system, according to a spokesman.

Also included in 3M's automated system are an analog-to-digital subsystem, a digital interface subsystem, magnetic tape subsystem, graphics plotter, teleprinter, terminal printer and CRT terminal. The system will facilitate 400 channels for testing.

Fabri-Tek Brings Out Core Memory System With 650 Nsec Cycle

MINNEAPOLIS – A minicomputer core memory system called the Model 696 has been introduced by Fabri-Tek, Inc.

The system consists of 16K 18-bit words. Up to eight modules may be used in a single enclosure.

The system is field-expandable to 256K 9-bit words, 128K 18-bit words or 64K 36-bit words.

Full cycle time for the 696 system is 650 nsec; data access time is 250 nsec. The system is compatible with TTL logic and is a direct plug replacement for the Electronic Memories and Magnetics' Micro 3000 series memory, Fabri-Tek said.

System Options

System options include enclosures with built-in expansion capability, power supplies and extender boards.

The system costs $1,664 and is available from the firm at 5901 S. County Road 18, 55436.

Western Tape's Controller Combines PE, NRZI Formats

ANAHEIM, Calif. – A magnetic tape controller that combines PE and NRZI formats on a single board and fits a single slot in Data General Nova computers has been developed by Western Peripherals Corp.

The TC-120 magnetic tape controller includes the board and tape drive cabling. As the TS-120, it includes tape drives and cabling in a fully integrated and tested system, the firm said.

The unit can mix 7-track and 9-track NRZI, PE or dual-density tape units in any combination up to eight units, according to the company.

A 33-word data buffer in the TC-120 gives flexibility in programming data transfer to the computer by relieving the data channel servicing requirements of the tape controller, a spokesman said.

The TC-120 sells for $3,100. Prices for the TS-120 range from $5,500 to $9,600 depending on tape speed and dual or single drive.

The firm is located at 2893 East La Palma, 92806.

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Versatile Operating Systems

Coming up with the right kind of software means designing operating systems with as much versatility as you'll find in the hardware. The TX990 Executive Operating System uses the 990/4 microcomputer for low-cost multi-task control with a minimum of peripheral support. Users can select only the function they need for efficient memory usage, leaving more memory available for application software.

For larger 990/10 systems requiring mass storage and rapid access to programs and data files, the DX10 Disc Operating System gives you all you need and eliminates most of the time-consuming work previously associated with system generations. It includes a utility for constructing and testing software, and controls our "Librarian" software package for source and object program files.

Flexible Packaged Systems

TI offers two packaged program development systems and a prototyping system for the user who needs his own stand-alone system for software and firmware development of application programs.

These packaged systems provide a flexible method of implementing early project development. These include the low-priced 990/4 Program Development System and the powerful 990/10 Program Development System. The 990/10 system combines the power of



the 990/10 minicomputer with the disc-based DX10 operating system and an extensive set of software development tools. The standard package includes the 990/10 minicomputer with 64K bytes of error-correcting memory, ROM loader and diagnostics, 3.1-million byte removable disc kit with accompanying peripherals, and a complete software development package. And, at $24,500, this system costs at least 20% less than comparable equipment from other manufacturers.

For developing firmware modules, there is a $5960 prototyping system which includes a 990/4 computer with 16K bytes of memory and programmer's front panel, and a "Silent 700*" twin-cassette ASR data terminal. Also, an optional PROM programming kit is available for developing read-only memory.

And, we provide a wide variety of program development utilities for the 990 family. There is communications software that supports either synchronous or asynchronous data transmission, and can operate with the TX990 or the DX10.

Support from the start

In addition to software, the TI 990 family has another kind of support that's basic to every TI computer product. Complete training and applications assistance, plus a nationwide service network backed by TI-CARE†, our remote diagnostic, service dispatching and real-time field service management information system.

For complete details on the new 990 family, call your nearest TI office or write Texas Instruments Incorporated, P.O. Box 1444, M/S 784, Houston, Texas 77001. Or, phone Computer Equipment Marketing at (512) 258-5121.

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Key Tronic presents DATAWAND, the handheld OCR system. DATAWAND recognizes eight differant character fonts, including OCR-A alphanumeric, MICR, E13B, 1428, and 7B. DATAWAND reads any size form at speeds up to 100 characters per seond and is RS-232 plug compatible.

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ADABAS — tha Adaptabla DAta BAse System — is a generalizad DBMS which supports a natwork of files using inverted file techniques. ADABAS providas data compression, efficient space managemant, data protection, data security, and host and self-contained language facilities. Over 60 installations in North America.

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DATAPOINT CORPORATION

Datapoint will show it's line of Dispersed Data Processing equipment. This includes intelligent terminals, small business computers and a multi-user, multi-task business timesharing system.

All these systems will be running typical business processing programs such as source data entry, and inventory control.

wabash

Wabash Tape manufactures and supplies the following full line of magnatic media; i.e., computer tape, disk packs, flaxibla disks, digital cassettes, disk cartridges, and magnetic cards. Wabash is located in the midwest with offices throughout the United States and in Canada.

TEXAS INSTRUMENTS
INCORPORATED

Taxas Instruments will display and demonstrata models of thair 990 Family of micro/minicomputers, as well as models of their Silent 700* Electronic Data Terminal Family.

*Trademark of Texas Instruments.

INTERDATA

Interdata, Inc. will display its 16- and 32-bit computers and Carousel printer terminal — high reliability products with performanca, packaging and pricing designed to provide sophisticated OEMs and end users with the most cost-effective tools available for thair computing needs.

NCI

"Considering the price of SLICK and its performance, there's no reason to pay more for a library system." Bob Martin — CHATTANOOGA ELECTRIC AND POWER BOARD.

SLICK, a true price performance source program library system, costs as littla as $78.00 per month.

MEGADATA

Megadata Computer and Communications Corporation will show a complata family of products; the new improved "POWERSCOPE" family of intelligent programmable terminals; the bi-lingual, terminal; the text editing terminal; the color display; the terminal used in the banking community; the touch screen terminal; and a number of peripherals such as floppy disks and peripherals.

Atlantic Research will feature:
- Intershake II, Line Protocol Tester Simulator, speeds to 64 Kbps, enlarged memory.
- Cassette recorder and CRT monitor for Intershake.
- Three bay Network Control System, NCS-100 including rack-mounted Data Tek 9600, Intershake and Analog and Digital Patching/access systems.

Consolidated Computer

"CONSOLIDATED COMPUTER will be displaying the naw KEY-EDIT 60 key-to-disk systam for small to medium sized users. More than a data entry system, KEY-EDIT 60 has powerful editing, processing and communications features to help distribute the data processing workload."

SYCOR INC

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Although Business Picked Up

Neither Trauma Nor Exuberance Marks Vendors' '75

By Molly Upton
Of the CW Staff

The computer industry observed 1975 with neither trauma nor exuberance. Perhaps most notable this year was the OEMs' tenacious belief that things would improve.

And improve they did. By late summer, most vendors were reporting that business indeed was picking up.

OEMs feel they have managed to stay in the roller coaster car on the downslope through the beginning of the year, through the dim dank tunnel and are now experiencing an upward ride.

For other sectors, such as independent software firms, the economy seemed to have relatively little if any adverse effect.

If anything, users were giving more consideration to buying outside packages. Data base material seemed an especially hot area.

Increased participation of software firms was noticeable at exhibits and conventions during the year.

Elsewhere, many add-on memory makers also credited the recession for increased order rates. Firms that formed units to market to the end user seemed satisfied with their new approach.

Lines Blur

The lines between minis and micros continued to blur, aided in part by several minimakers' announcements of products in the micro realm or very close to it.

Meantime, mini makers, unsatisfied with what had been considered a reasonably well-defined realm, also have decided to poach on the grounds formerly the territory of the larger mainframers, just as many of the latter also came out with smaller systems.

Minis with 3330s, 256K memories and sizable price tags are regarded not as dinosaurs, but as members of the species.

The price of core memory continued to decrease, enabling vendors to offer either bipolar or core, and many mix both in systems, using core for sensitive data users do not wish to entrust to power-failure-sensitive bipolar memory.

More powerful chips are coming down the pipeline from the semiconductor makers, and the industry seems to be adopting the 4K random-access memory (RAM) and frequently passing along price cuts to the users.

It is a matter of time before there is a wide-open race among minimakers for in-house LSI facilities, as the trend toward vertical integration continues.

Intelligence continued to wander further afield from the mainframe into terminals and peripherals.

And makers of intelligent terminals and key-to-disk vendors find themselves coming close to pawing over the same turf. As of now, they say they do not address the same markets, but time will tell.

Software Revenues to Double by '79

NEW YORK – Revenues generated by the software industry should more than double between 1974 and 1979 – from $1.29 billion to nearly $2.8 billion, according to a report by Frost & Sullivan, Inc.

The 1984 revenues should reach $5.2 billion, the report forecast.

In estimating 1974 revenues generated by types of packages and services, special industry and data base services led with $494 million, followed by general packaged services, $312 million.

Standard software packages ranked third with $147 million, followed by industry-oriented applications, $109 million; general applications, $88 million; and systems software, $62 million.

The latter will have an estimated growth rate of 45% to 1979, which should bring revenues to $398 million, moving it into third behind special industry and data base services and general packaged services, respectively.

By 1984, systems software, with estimated revenues of $886 million, will be second only to special industry and data base services, which should bring in $1.17 billion, according to the report.

Breaking down the figures another way, Frost & Sullivan projected packages for credit and banking should generate $389 million in 1979, data base management, $252 million and subsystems software, $236 million.

Fourth is general business at $154 million, with banking weighing in at $85 million and insurance at $43 million in 1979, according to the report.

Independents' Packages

Users rated independents' packages at an average of 3.73 points out of five, while mainframers averaged only 2.7.

Users gave independents a 3.81 chance of success in competing with manufacturers, while suppliers rated their own chances at 3.57.

The principal reason for preferring independents' products was operation and performance, although hardware manufacturers' products were preferred for service and support, the users replied.

The study was compiled from 221 user and 75 vendor responses.

Although vendors overrated the performance operation of their products compared with users' evaluations, vendors gave themselves lower marks than users on maintenance/service, efficiency and documentation.

The performance/operation of products elicited a 3.68 average rating by users and a 4.59 by vendors.

On the other characteristics, vendors and users were within .50 points of each other.

About 76.6% of users indicated they would select the same product again. Packages in the industry-oriented applications area had the highest percentage of negative responses, 21.9%, while standard software had the least, 8.6%.

Frost & Sullivan observed this might be

(Continued on Page 41)

X3T9 OKs Ballot On IBM Interface

SAN DIEGO, Calif. – The American National Standards Institute (Ansi) X3T9 technical committee on input/output interface standards advanced the IBM 360/370 design one step further toward presentation to the X3 standards committee.

The X3T9 committee approved by a vote of 12-3 with one abstention to send the proposal out on a letter ballot to all members of its committee.

Those X3T9 members who object to the proposal are required to detail their objections in writing.

Approval by two-thirds of the committee is required before the proposal is sent to X3, according to Delbert Shoemaker, X3T9 chairman.

Members of X3T9 vote as individuals, he said, and are supposed to consider only technical issues at this level.

When and if the proposal reaches the X3 level, ballots will be cast representing the member companies and the issue will be more subject to political considerations, an observer said.

Once the editing committee makes the changes agreed on at the meeting, the ballot will go out to members. Return is required within 60 days, Shoemaker said.

Japan Liberalizes DP Imports, Extends Foreign Equity in Firms

TOKYO – The Japanese government moved toward increased liberalization of DP equipment imports as well as foreign ownership of Japanese firms in December.

Now it is possible for a foreign firm to own up to 100% equity in a Japanese firm. Previously there was a limit of 49% ownership.

Effective Dec. 25, imports of computer products are under an automatic import quota, which means import approval is granted within a week or so, compared with up to three months before, according to an article in *EDP/Japan Report* (EDP/JR).

However, it is likely the Japanese will seek another method, higher tariffs, to enforce a long-standing principle that foreign DP products should account for only 50% of the market, according to EDP/JR.

Under the old procedure, imports had to go through a governmental screening process which required identification of end users of imported computer products.

The government also required documents indicating the need for machines of foreign manufacture.

When foreign products held more than 50% market share, the government instituted a more rigorous screening process, according to the report.

Industry observers expect the government to continue to attempt to protect native industry by suspending the temporary duty rates applied to CPUs and peripherals and applying the standard duty rates approved by the General Assembly on Trade and Tariff, EDP/JR said.

This would raise rates on peripherals from 22.5% to 25% and rates on CPUs from 13.5% to 22.5%, the report said.

The Japanese government indicated it considers this change as simply a return to the original basic duty rates and not involving any true revision of the duty schedule.

"So far, the temporary duty rates have been adopted as a tentative measure to avoid harassment by the U.S. government, which has been urging the lifting of all restrictions on imports of computer products," EDP/JR said.

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HI Business on Rise Despite Flat Small-Plotter Mart

By Molly Upton
Of the CW Staff

NEWTON, Mass. – Although market projections for the small-plotter business have been flat, Houston Instruments' (HI) business in this segment has been rising, Tom Hall, program manager, said in an interview here.

Since 1968, when HI entered the small ink-on-paper plotter market, it has increased its market share to about 30%. California Computer Products, Inc. (Calcomp), which held about 95% to 98% of the market in 1968, probably has about 50%, with the rest going to four or five other competitors, he said.

Although somewhat arbitrary, Hall said he defines the small-plotter market as those up to about 22 in. or 36 in. wide. Market projections for this segment are about $8 million to $10 million annually, he said.

HI is not structured to handle small quantities at high prices, he said, but rather, likes to compete on price in large volume. Also there is more competition in the larger market, he said.

HI prices its products about 15% to 20% less than Calcomp, he said.

The plotter market "was a bit of a surprise to us. There appears to be a large tendency on the users' part to stick with a product they've seen running in some other location for a period of time," Hall said.

Both Calcomp's 565 plotter, introduced in 1962, and HI's DP-1, which came out in 1968, are still available, he said.

HI has not seen sales peak on the DP-1 yet, he said, although its experience in instrumentation markets indicated sales should have started slacking off three years ago, he said.

Hall attributed the longevity of product popularity to the tendency of customers to stick with a proven and tried product rather than to the lack of new products.

HI's DP-1, its original plotter product, was "bulit like a brick outhouse," he said, as it was designed for use on small ships. It can survive being dropped four feet without a packing case, he said.

This characteristic was probably more important in gaining a foothold in the market than anything else, Hall said.

Most minicomputer manufacturers tend to feel plotters are a nuisance to have to provide, and they don't want to bother with in-house production, contrary to the trend exhibited by many toward vertical integration, he said.

The thought of producing plotters produces a "loud yawn" by many mini makers, he said.

Data General Corp. uses HI as standard equipment on its products, with Calcomp as an option, he said, and Digital Equipment Corp. provides either HI or Calcomp units, he said.

HI units are used principally on minicomputers, Hall said. Electrostatic plotters have made their primary inroads in use with moderately large computer systems, since they require a large amount of core as well as additional storage to run efficiently, he said.

Software for an incremental plotter can operate in 1K of core, he said.

Software Supplied

HI supplies software at no additional charge when it has that software available, he said.

However, in small plotters, the software is not much of a factor as it is universally available, he said. For example, the DEC users group (Decus) offers software, as does Data General, he said.

HI has a line of three ink-on-paper plotters, which it sells both to end users and OEM: the DP-1, 11 in.; DP-3, 22 in.; and the DP-7, 36 in.

These plotters use fan-fold paper as opposed to roll paper, he said, which makes it easier to review plots in the middle of the sheet.

An OEM plotter, the DP-10, uses a single sheet of 11 in. by 17 in. paper and is a "fallout of the firm's X-Y recorder business, since it uses the same frame," he said.

Lately HI has been marketing plotters for use with remote batch terminals, he said. These systems are usually leased because the entire system is on lease, he said. HI has interfaces to the Control Data Corp., Data 100 Corp. and Mohawk Data Sciences terminals, he said.

Although installations in the remote batch are now a small part of HI's plotter business, Hall epects it to grow, based on projections for the overall remote batch market.

Digital plotters account for about 40% of HI's sales, with the remainder from analog X-Y recorders and low-cost analog strip-chart recorders, he said.

As a division of Bausch and Lomb, HI is able to handle its own leases, he said. HI is based in Austin, Texas.

HP Shares Profit

CUPERTINO, Calif. – 'Tis the season. Santa will distribute $11.1 million to more than 25,000 Hewlett-Packard Co. employees as part of the firm's profit-sharing plan. Total disbursement for 1975 is $21.4 million.

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Study Predicts Software Revenues to Double by '79

(Continued from Page 39)

partially because the results of applications packages are more visible than those of standard software packages.

Packages Acquired

Excluding operating systems and other standard systems software packages developed by hardware manufacturers, 81.9% of the responding users acquired a software package or packaged service within the past two years, an increase of 2% from the previous Frost & Sullivan survey in 1972.

These 181 users obtained 487 packages, for an average of 2.7 per user.

The number of packages and services obtained in 1974 rose by 72% over those in 1973, the study indicated.

In 75% of the cases, packages were used daily, and nearly 70% of the packages were used without modification, users said.

Most of the users surveyed were installations with over 1,000 employees. EDP budgets for nearly half were between $t million and $5 million.

About 85% of the users indicated they spent less than 1% of their annual EDP budget on each package or packaged service.

The findings are skewed toward standard software packages rather than applications packages since the respondent was the DP director, who is not always aware of applications packages purchased by the end user, the report observed.

The number of standard software packages acquired by the respondents was 183, with utilities being the singular most popular category, with 43 packages.

General applications packages totaled 71, with payroll leading the pack with 21.

Systems software packages totaled 36, with data base management systems numbering 22 and self-contained systems, 14.

Hardware dependent/dedicated systems installed 31 packages while there were 25 in the industry-oriented applications category.

Voids in Market

The survey indicated voids in the market.

Forty-one users, of which 20 were in manufacturing, said they were unable to acquire 53 particular packages and/or packaged services.

Almost half the products sought were applications packages; t0 were standard and systems software packages, with most of the remainder being specific items such as bank applications.

Nineteen users indicated the packages or services they sought were unavailable. Most users wanted a package immediately.

But only 39 suppliers agreed there are some partiatly serviced industries, and none mentioned transportation or utilities as possible new areas for products.

Twenty-one packages or 19% accounted for 71% of the 487 packages and services acquired by these users during the past two years.

Vendors offer an average of 3.4 items per supplier, the report said.

As a percentage of the selling price of a package, vendors listed the average development cost as 21.9%; marketing, 27.4%; profit, 16.9%; maintenance or service, 16.8%; overhead, 11.9%; and reproduction at 5%.

Vendors indicated the life expectancy for most products is five to t0 years.

How were sales made? In 37.9% of the cases, users selected items by direct sales, with word of mouth the method for nearly 27%.

In all categories of software, suppliers rated their sales forces as the most successfut selling technique.

However, within categories there were some variations on the effectiveness of methods. Direct mail got higher marks for application packages than for systems software, the survey showed.

The chief problem in marketing is users' lack of awareness of their product and its capabilities, vendors said.

Other problems were in securing well-qualified sales personnet and users' desire to develop items in-house, the survey indicated.

French Arm of CMC Sold to Dutch Firm

MARINA DEL REY, Calif. – Computer Machinery Corp. (CMC) has completed its efforts to sell its European operations with an agreement to sell 85% of the shares of CMC France S.A. to Telsys Corp. Holding N.V.

Telsys, along with some former CMC Ltd. executives, also bought CMC Ltd. and the German subsidiary.

Telsys has an option to purchase the remaining shares of CMC France and has agreed to buy $9 million worth of products from CMC over the next five years.

No effect on CMC's Income statement from the sale is expected because proceeds are about equal to the book value of the French subsidiary plus amounts owing against intercompany debt, the firm said.

In addition, it was agreed the remaining license fees and territorial royalties owed by CMC Ltd., which was sold in 1973, will be prepaid. This will result in a $1 million contribution to profit, the firm said.

CMC has planned its former subsidiaries would become independent distributors and possible manufacturers of CMC'products under license agreements.

Talks of the proposed Pertec Corp. acquisition of CMC are proceeding on schedule, a spokesman said.

Univac's ISS Signs to Buy Media Assets of Caelus

CUPERTINO, Calif. – The ISS operation of Univac has signed an agreement with Electronic Memories and Magnetics for purchase of certain of the media manufacturing assets of its Caelus Memories, Inc. subsidiary.

E.T. Bahre, vice-president and general manager of ISS, said the acquisition provides ISS with an excellent internal media development and manufacturing capability to support ongoing disk drive development programs and, in line with future fixed media product plans, reduce dependency on outside independent media suppliers.

The agreement provides for ISS to take over the existing Caelus facility in San Jose with key Caelus development and manufacturing personnel joining ISS.

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A list of current seminars is given below. To register for any seminar, or if you'd like more information, just check the appropriate box and send in the coupon.

How to Increase Programming Productivity
A 2-day seminar for technical managers on the state of the art of Software Engineering. Led by John W. Brackett, PhD, Vice President of SofTech, Inc., and Clement L. McGowan, PhD, Consultant. Fees: $300, including continental breakfasts, luncheons, and all course materials. $250 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Jan. 26-27**
Chicago	**Hyatt Regency O'Hare**	**March 8-9**

Legal Tools for Computer Contracting and Protection
A 2-1/2 day seminar that shows you how to increase your advantage in dealing with vendors that supply your installation. Includes discussion and review of your own contracts. Led by Roy N. Freed, the nationally known lawyer, author and educator in the field of computer law. Fees: $325, including continental breakfasts, luncheons and all course materials. $275 for additional registrants from the same company. Schedule:

Wash., D.C.	**Marriot Crystal City**	**Feb. 4-6**
Orlando, Fla.	**Sheraton Towers**	**Feb. 18-20**

Performance Evaluation and Improvement
A 2-day seminar on measurement techniques that are designed to save your installation money. Led by Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement and improvement.* Fees: $250 per registrant, including continental breakfasts, luncheons, and all course materials. Schedule:

San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**
New York	**Summit Hotel**	**Feb. 9-10**

Data Communications Course #1010 - Practical Data Communications Systems & Concepts
A 2-day seminar on the newest advances in data communications, including SDLC, DDS, new tariffs, equipment characteristics, and the impact of satellite carriers. Led by Dr. Dixon Doll, Teleprocessing consultant. Fees: $350, including continental breakfasts, luncheons, and workbook and reference materials. $300 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Jan. 26-27**
Chicago	**Hyatt Regency O'Hare**	**Mar. 15-16**

Data Communications Course #1020 - Advanced Teleprocessing Systems & Concepts
A follow-up to course #t010, this 3-day seminar emphasizes techniques that minimize operating costs in commercial data communications networks. Also led by Dr. Dixon Doll. Fees: $450, including continental breakfasts, luncheons, and an extensive set of customized course materials. $400 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Feb. 23-25**

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30% Annual Increase Expected

Remote Processing Showing Strong Growth in Canada

TORONTO – Remote DP is growing three times as rapidly as the computer industry in general, David M. Carlisle, vice-president of Datacrown Ltd., said here recently.

This trend, based on extensive use of communications networks, is enabling DP users to centralize control and hardware while extending computer access to many branch sites, he told a meeting of the Association for Systems Management.

"Remote processing will account for some $80 million of the $800 million that will be spent on DP in Canada in 1975," Carlisle said.

"Remote processing can be expected to increase at 30% annually, compared with a 10% growth rate for the entire industry," he predicted.

Remote processing is being encouraged by organizations that have centralized their own facilities and by the increasing reliance on computer service companies offering large-scale facilities serving many clients, Carlisle said.

In three years, 42 large organizations have converted from their own in-house facilities to Datacrown's shared-processing network, he said.

International News

Remote processing in Canada is following a "significantly different direction than in the U.S., where most of the activity has been in the time-sharing and facilities management sectors," he noted.

"Potential users of remote processing have a number of requirements which must be met by suppliers. They must be assured that their growth requirements will be met; that they enjoy adequate security; that they retain control over scheduling, programming and costs; and that the reliability level meets or exceeds that of in-house equipment," Carlisle noted.

The division of responsibilities has become clearly defined between clients and suppliers in remote or shared processing, he added.

The supplier must look after the computer, systems software, technical support and the security of client program and data files.

The client's responsibilities include the systems and programming staff and development of applications, the maintenance of terminals and staff, preparation of source data and handling of output reports, he said.

Foreign Orders & Installations

The State Services Commission of New Zealand has ordered a Univac 1110 to serve the New Zealand Government Departments of Police and Justice and the Ministry of Transport. The system will initially include 200 Uniscope visual display terinals and 180 attached hard-copy printers.

The British Department of Health and Social Security will install a Graflx 1 optical character reading system from Information International Grafix, Ltd.

Karstadt Co., a West German department store chain, has ordered a second Univac 494 for personnel information, commodity control and the automatic calculation of order quantities.

Bank Brussels Lambert of Belgium has ordered a B7700 and B6700 from Burroughs Corp.

The Manitoba Government Computer Centre has ordered a System 2000 from MRI Systems Corp. to support management, administration and research functions.

The Bank of Pusan, Korea, has ordered a Control Data Corp. Cyber 172 system as the nucleus of an on-line banking communications network under development.

National Westminster Bank of Great Britain has ordered 100 self-service NCR 770 teller terminals.

The Agua y Energia Electrica of Argentina has ordered five process computers of the Siemens 300 line for its load dispatching center under construction.

British Airways has ordered intelligent terminals from Incoterm, Ltd. to access a real-time component control system.

Paplerfabrik Balsthal, a Swiss manufacturer of paper products, has ordered a B2700 computer system, a TC 4000 printing terminal and two TD 800 input and display terminals from Burroughs Corp.

Eurocontrol, an organization involved in European air navigation safety, has ordered a distributed computer system from Hewlett-Packard consisting of an HP 9700 series system and three satellite HP 9600 series systems.

Petroleos Mexicanos, Mexico's government-owned petroleum company, has installed a Control Data Corp. 6400 computer at the site of recent resource discoveries in southeastern Mexico.

Ford Motor Co.'s European headquarters in England has ordered four Univac 90/30s.

Copenhagen Telephone Co. has ordered a Honeywell dual Model 66/40 to handle all orders for new telephones and billing.

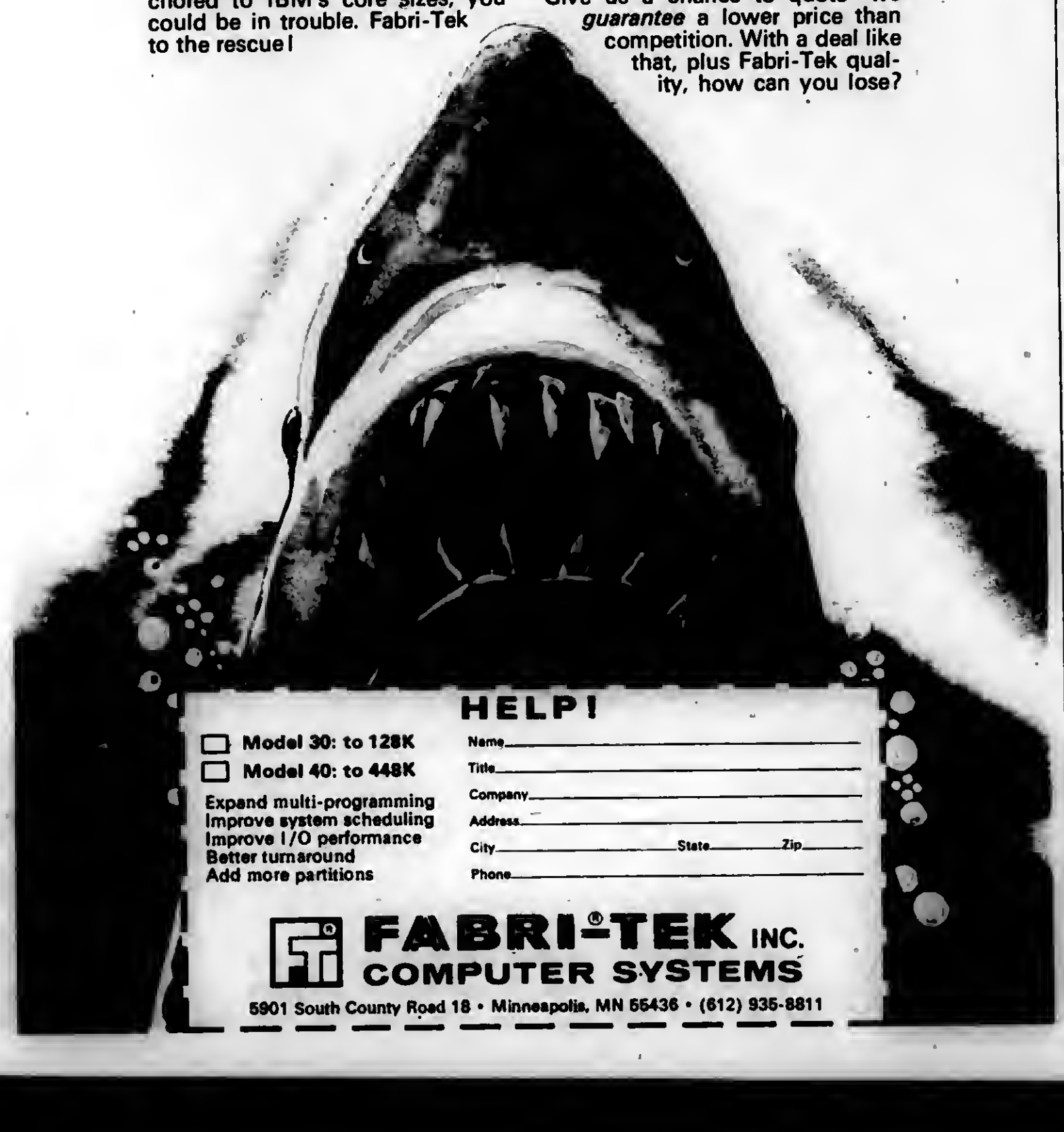
Environmental Elements Corp., a subsidiary of Koppers Corp., has installed a Hewlett-Packard 3000CX mini data center to manage in-house purchasing, accounting and scheduling operations.

Tokyo Motor Works, a division of Mitsubishi Motors Corp., has ordered a Univac 1110 to expand its real-time order entry system and establish a mangement information control system.

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Commerce Reports

German Imports of U.S. Machines Rise 20% in '74

By a CW Staff Writer

WASHINGTON, D.C. – Although the German market for business machines increased only marginally in 1974 to $1.84 billion from $1.82 billion in 1973, imports of U.S.-made computers and peripherals rose 20% to $195.2 million in 1974, according to a report from the Department of Commerce.

Imports of U.S. equipment rose another 6.5% in the first six months of 1975, principally from demand for peripherals and calculators, the report indicated.

Equipment imported from the U.S. and other countries totaled 56.7% of the German DP market in 1974 compared with 52.5% in the previous year.

U.S.-made equipment accounted for 37.4% of the German market in 1974. The closest rival was the UK, with imports valued at $80 million, Commerce said.

Broken down by categories, German imports of U.S. hardware rose in all areas from 1973 to 1974 except for central memories sold separately, which declined 2.1%.

Imports of U.S. DP machines in 1974 rose 9.9% to 40,920 units while central units and processors rose 37.2% to 83,594 units.

Peripheral memories rose 15.6% to 169,460 units and represented the largest dollar value at $64.4 million, Commerce said.

Peripherals totaled $36.3 million and CPUs $31.8 million, the report said.

The total installed base of mainframe units in Germany in 1974, excluding smaller systems and minis, was 20,860 units with a value of $8.1 billion, the report said.

Fewer Orders Predicted

"As the recession continues, end users have become suspicious of the 'oversell' which was widely practiced by DP firms in more prosperous times," the report said. "There will be few orders for equipment which is not specifically needed in an enterprise's daily operations."

Sales for DP hardware in 1976, 1977 and 1978 are extremely difficult to predict in the present economic situation, the Commerce Department report stated.

"Knowledgeable sources cautiously estimate an annual growth rate of 6% to 8% for the coming three years, with individual product groups, such as minicomputers and terminals, exceeding that average," it noted.

Best sales prospects for U.S. products exist for all types of intelligent terminals and certain types of high-performance peripherals, such as fast printers, optical character reading equipment and computer output microfilm, according to the report.

The market for medium-sized and larger systems is beginning to show signs of saturation, the report indicated.

IBM ranked first and Siemens AG second as the major computer suppliers in the German market during early 1974.

IBM increased its number of installed systems 5.5% to 7,386 units and Siemens recorded a 13.6% increase to 2,107 units, according to the report.

According to Diebold Management Report, at the beginning of 1975 the value of installed IBM computers in Germany totaled $4.2 billion and the value of installed Siemens machines totaled $1.7 billion, Commerce said.

From these figures, Diebold calculated IBM holds 51.9% of the market by value while Siemens has 21.3%.

International News

Mini Show Set for Germany

FRANKFURT, W. Germany – The U.S. Department of Commerce is planning an exhibit of minicomputers and microprocessors at the U.S. Trade Center here next October.

Firms interested in participating should contact Edward E. Heiser, Germany/Austria marketing manager, U.S. Department of Commerce, BIC/OIM, Washington, D.C. 20230.

Systems 75 Proves Success to Exhibitors

MUNICH, W. Germany – Systems 75, the German trade fair, was a definite success this year, according to a U.S. Commerce Department poll of exhibitors which showed both national and foreign exhibitors experienced a positive response from attendees.

Sixty-seven firms participating in the U.S. exhibit at Systems 75 realized floor sales of $2.4 million and had one-year projected sales of $63.1 million from the show.

About 98% of all exhibitors established new business contacts, Commerce said.

The number of attendees was up from 9,000 in 1973 to over 12,000 this year, according to the show organizers.

Orders From Eastern Bloc Total $15.3 Million for CII

PARIS – Compagnie Internationale pour l'Informatique (CII) has received orders from Eastern Bloc nations for equipment valued at $15.3 million.

The Soviet Union ordered about $9.1 million worth of equipment, including two Iris 80 mainframes and six Mitra 15 minis.

The order was placed by the import-export agency, Electronorgtechnika, which indicated the machines would be used for "scientific applications" but gave no further details, according to a report in *Computer Weekly*.

CII also received an order for an Iris 80 from Poland's Mera, a large manufacturer of electrical equipment.

They're dedicated, but are they loyal, trustworthy and efficient?

A review of "Dedicated Systems" in our January 26th Supplement.

Many users - especially small and first-time users - face a serious dilemma in this age of escalating technology and escalating prices. They need computing power tailored to their needs to solve specific problems, but they don't have the resources or the staff necessary to develop a system of their own. Systems houses have been playing a significant role in helping users get around this hurdle, because they offer users the hardware, software and systems support they need in one readily available package. The customized configurations provided by the systems houses offer users a maximum amount of computing power with a minimum requirement for professional staff to operate and maintain the system.

In this special supplement we'll be taking an indepth look at systems houses and the minicomputer-based turnkey systems they provide. And we'll be answering some very important questions like these: Who are these systems houses, and what do their services cost? What kinds of problems can they solve, and how do their solutions compare to those offered by the mainframe vendors? We'll review several case histories for specific applications, including tutorials on ways minis can be programmed to solve specific problems.

If you're involved with dedicated systems at your installation, or if you will be in the near future, then you should be reading this special supplement in the January 26th issue of *Computerworld*. And if you're a developer and marketer of turnkey systems, then you should advertise them here. Ad closing is January 9. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Centronics Plans Future as One-Stop Supplier

By Molly Upton
Of the CW Staff

HUDSON, N.H. – Centronics Data Computer Corp. plans to be a one-stop supplier of ali printer requirements for firms in the computer industry, Robert Howard, Centronics president, said recently.

Known for its medium-speed printers, the firm's intent is to suppiy printers from 1,200 line/min down to a teletypewriter replacement, he said.

Centronic's basic business philosophy is to offer products that are either twice as good or half the price of the competition, he explained.

Aithough not easy, Howard said it is easier and less costly to obtain a decent market share through this philosophy than through playing "me too."

Probably 50 printer companies in the past five years have come and gone, he remarked.

Speaking of the trend to vertically integrate, Howard said he is surprised many companies "haven't done their own thing up to now."

Centronics tries to give the customer the economic justification to buy printers rather than make them, he said.

Many firms that decided to manufacture printers have discovered the iag between design and market time puts them at a disadvantage. These firms then decided to buy their printers, he expiained.

Centronics has added at least i0 models during the past year because it is more important now to match the printer more precisely to a system's needs since it is one of the most expensive peripherals, in many instances, Howard said.

Earlier, major customers could use one printer for all applications, regardiess of whether the particular printer was more powerful than the job required, he said.

Market to Grow

Howard sees the printer market growing faster than the overall computer industry because of the increasing ratio of printers to terminals.

Whereas several years ago there would be one printer associated with 10 terminals, two years ago the ratio was 1:6, he said, and is now 1:4.

Sam Irwin, president of Sycor, Inc. recently predicted that within a year or two the ratio would be i:1, Howard observed.

Centronics has an 88 char./sec printer that is price-competitive with most 30 char./sec printers, Howard said.

'Hard to Get Divorced'

"It's easy to get married and difficult to get divorced," and the same appiies to selecting an OEM printer supplier, he said.

Through the high commonality of parts, Centronics customers can have six models in the field and stock parts that would normally cover perhaps two models, he said.

In addition, Centronics trains OEM service engineers and "once they're trained on one of our machines, they can service any of our machines," he said.

Centronics also can save OEMs from stocking spare boards because on many of its machines the trouble can be isolated to an LSI chip, which can be replaced.

Centronics' capability in the electronics area is evident in its line of over 30 types of interface as well as a programmabie microprocessor interface. This alleviates the burden on the OEM customer of having to design interfaces, according to Hank Weiss, director of marketing.

Today, five years after its introduction, Centronics' principal revenue producer is the Model 101, a 165 char./sec printer. Howard foresees demand for this product flattening out and decreasing as newer offerings become more popular and peak out five years after their introductions.

"I anticipate a product life of 10 years on any of our products," he said. Product life, he explained, means the duration of manufacturing.

Centronics enhances its products throughout the years, he said, which helps sustain the life of the product line.

Blessing in Disguise

"The demise of our reiation to Core" – formeriy Centronics' distributor in the UK and Germany – "was a blessing in disguise," Howard said.

"It forced us into very quickly and aggressively establishing our presence in Europe, which we have done extremely effectively," he expiained.

The ievel of business three months after starting its own efforts in Europe is greater than it was with Core, he observed.

Centronics now has subsidiaries in Germany and the UK and is in the process of forming one in France. The firm also has distributors in eight other countries.



CW Photo by M. Upton

Robert Howard

CMI Offers Circuit Boards

BEDFORD, Mass. – Cambridge Memories, Inc. (CMi) is offering double-sided flexible and standard printed circuit boads, which it has been making for internal use.

The firm's Circuit Memories, Inc. unit here can provide line widths and spaces as narrow as 1 mil, with boards avaiiable in standard bilayer, multilayer and the double-sided flexible print, the firm said.

"We refined our own printed circuit capability in order to continue the development of our Domain Tip [DOT] memory which uses flex print. We've been manufacturing and shipping flex print in DOT memories for over three years," said Dr. Robert Spain, vice-president of the firm's Newtonviile Research Facility.

Itel Group Reorganizes

WHITE PLAINS, N.Y. – Itel Corp.'s Data Services Group has been reorganized in a program that expands the DP and Industry Systems divisions into five profit centers.

The program includes new products, new geographic iocations and an increased marketing force, according to William H. Bird, group president.

The new profit centers are in the eastern, central and western regions. The Accounting and Business Forms, Inc. and the group's Transportation Management Services company have also been instituted.

Decision Data Starts Unit

HORSHAM, Pa. – Decision Data Computer Corp. has established a Supplies and Service Organization to consolidate and centralize all spare part, supply and service center functions.

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SIA Plans Tutorials for Caravan Cities

NEW YORK – Shadowing the trend of software commanding more and more of the DP dollars spent today, the Software Industry Association (SIA) will sponsor an industry tutorial on Wednesday afternoona in each Computer Caravan '76 city.

The tutorials will be comparative in nature, discussing how and when to use outside sources of software producta and services, according to Lloyd Baldwin, SIA president.

Speakers will look at such things as decentralization of the DP function within a corporation and what it means to the DP manager and to top management, he said.

The tutorials will also examine the life cycle approach to systems development and, in general, discuss the role of software and software management.

The SIA, which is a division of the Association of Data Processing Service Organizations (Adapso), hopes, through these sessions, to show users a way to accomplish their universal DP wish of not reinventing the wheel, Baldwin said.

A different industry figure will lead the hour-long tutorial in each Caravan city.

Rather than representing the marketing function of their organizationa, al the SIA speakers are either presidents or aenior vice-presidents, sources noted.

The Caravan will mark one of the first occasions on which the SIA, as a group, is represented at sessions of this sort, but Baldwin feels the timing is right.

"The SIA is relatively new as an active group to begin with, and the induatry feels very strongly the importance of establishing its professionalism and reputation for dependability as a source for sofware products and services," Baldwin said.

'Adam' Logs In Orders

BURLINGAME, Calif. – Logical Machine Corp., formerly John Peers & Co., Inc., has installed 14 of its Adam small business systems and has 192 on order, according to John Peers, the firm's president.

The system was announced in April 1974. Two of the systems are installed in South Africa, Peers said, and the firm has distributors in South Africa and Australia.

Peers plans to have about six distributors in the U.S. and seven in the rest of the world.

Currently the firm is delivering six machines a month, but that figure should increase to 15 by February, he added.

Peers expects between $3 million to $4 million in sales in the firm's second year of operation.

The Adam system was designed for persons with no knowledge of programming, Peers said. It requires no software and uses English as its language.

Indeserv Offers Upkeep Service

LITTLETON, Mass. – Indeserv, an association of independent service companies, is offering DP firms a plan designed to centralize field service functions and provide nationwide service while minimizing spares inventory and keeping costs down.

The service is jointly provided by Critical Parts Supply (CPS), a division of Federal Express Corp., and Indeserv's nationwide chain of field service centers.

Manufacturers can stock their spares at CPS' central facility at Memphis International Airport, hub of the Federal Express system that extends to more than 10,000 communities nationwide, the company said.

If a machine goes down in the field, the local Indeserv office is advised of the problem by the customer or manufacturer and an analysis of the problem is made.

Direct Ordering

If a part is required, it is ordered directly from CPS. CPS personnel check the inventory status and suggest three alternative levels of service and their corresponding arrival times.

CPS then ships the part to the customer's site or the Indeserv office.

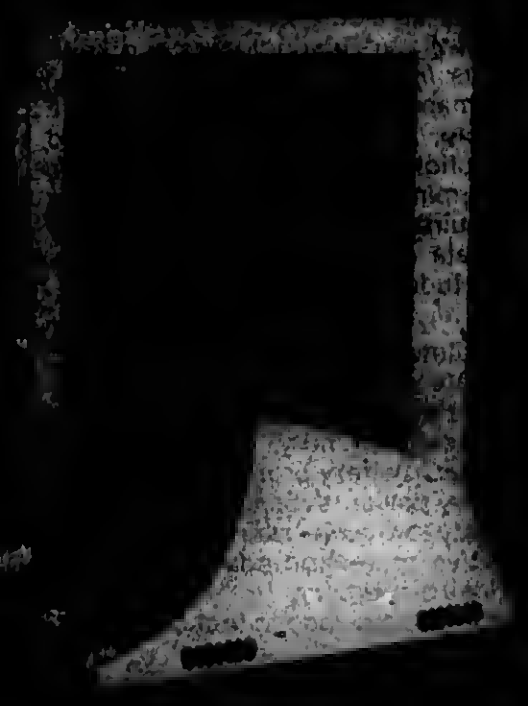
When the part is replaced and the equipment is in operation, the Indeserv technician can either repair the part locally, ship it to a parts depot for repair or return it directly to the manufacturer.

These options eliminate proliferation of excessive inventory and provide better control, Indeserv said.

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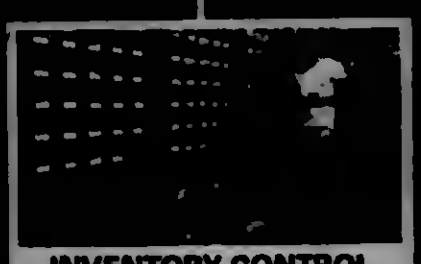
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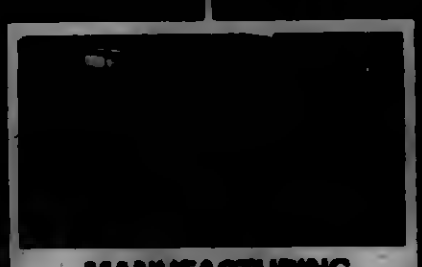



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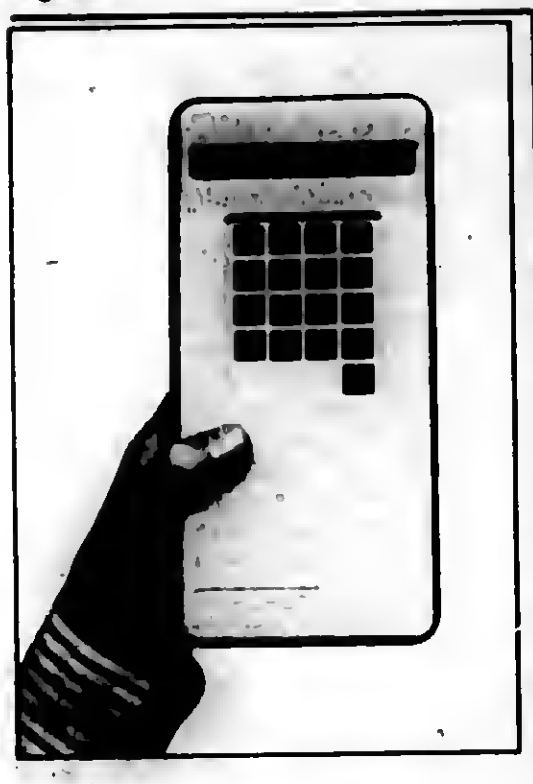

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Services Firms Included in Tour Made by Soviets

A delegation of Soviet technicians interested in learning about American agriculture visited two computer services firms recently as part of their tour.

At Computone Systems, Inc. in Atlanta, the Soviets learned about Computone's services to feed manufacturers as well as livestock and poultry growers.

Feed grain manufacturers use Computone's services on an IBM 360/65 to compute the least-cost formulation of feed that will meet various nutritional requirements, according to Thomas C. Newbill Jr., vice-presidant of Computone.

The customer inputs the prices he can obtain for various commodities and also indicates his own individual formulas. He receives printouts telling him what ingredients to buy and in what quantity, Newbill said.

Computone, in addition to being a services firm which specializes in applications for the meat-packing and insurance industries as well, manufactures a terminal for use by its customers.

Customers can also use either a Texas Instruments 725 or a Memorex 1240 for output purposes, Newbill said.

At Computer Sciences Corp. (CSC) in El Segundo, Calif., the Soviet delegation observed how CSC's remote-computing network, Infonet, serves the U.S. Department of Agriculture and other federal agencies.

The Forest Service keeps its inventory of timber in the national forests on the network and then determines how much and what kind of timber to cut, as well as when the land should be reforested.

The Department of Agriculture's Statistical Reporting Services on Infonet makes available its monthly report on U.S. crop production.

Paddling With Grumman

WOODBURY, N.Y. – Grumman Data Systems Corp. gave Computer Caravan attendees a chance to register for a prize that was totally unrelated to DP – a Grumman canoe.

Charles Sackett, a programmer from Winona, Minn., was the winner. He promptly took off on a fishing vacation.



More Than a Party

Users gather at one of several Invitational Computer Conferences being held in varioua locations around the U.S. and arranged by B.J. Johnson & Associates of Newport Beach, Calif.

Upcoming exhibits will be at the Houston Oaks, Jan. 15; Pier 66, Fort Lauderdale, Fla., Feb. 23; Orange County, March 25; and Stouffers Somerset Inn, Cleveland, April 13.

Continuous Forms Use on Rise

WALTHAM, Mass. – General-purpose computer site central batch printers used more than $1.1 billion worth of continuous forms last year and are expected to use in excess of $2 billion by 1980, according to a recent report on the continuous forms paper market published by International Data Corp. (IDC).

The use of stock forms will increase from 62% of the number of original sheets last year to 66% in 1980 as users switch more applications to stock paper to save money and as carbonless paper becomes more popular, the report indicated.

The use of customer forms will correspondingly decline from 38% last year to 34% in 1980.

Shorter lengths and widths of paper than the most frequently used 14-7/8 in. by 11 in. size will be more in demand, reflecting attempts to cut paper costs, the study said.

Last year the average large site used about 13.5 million original sheets of paper, the average medium site 3.6 million, the average small site under 1.4 million and the extra small site 700,000 sheets, according to the study.

Prices Increased

Forms paper prices increased 50% in 1974 because of a shortage of popular types of continuous forms and because of inflation, the study said. During the first quarter of this year prices remained stable as the demand fell.

However, during the second quarter prices decreased about 10% because of regional discounting by paper companies, the report indicated.

In response to this overall 40% increase, the following actions have been taken: over four-fifths (84%) of the surveyed sites reported they were attempting to reduce paper expenses by using computer-output microfilm (COM) in place of printer paper, reducing the number of reports, reducing the amount of paper used per report and/or minimizing the prices paid for paper.

In spite of these actions, continuous forms use will grow as the number of installed computer sites grows and as the volume of print applications increases at the current sites, IDC said.

Field Engineer Wins Mini

NEW YORK – Robert Pingicer, a field engineer here, won an XLO 3100 minicomputer in a drawing sponsored by American Used Computer at a recent conference.

Pingicer had been planning to take a course to learn how to build a minicomputer, so he was especially pleased to be able to skip the course.

Pingicer said he had never won anything before, but registered at the urging of his service manager.

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13 Treasurer/Controller/Finance Officer
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22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
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Systems Programmer

Assume responsibility for implementation, support and maintenance of MVS internals. Requires 4-5 years experience in OS/VS including at least 1 year SVS and strong ALC programming.

Teleprocessing Systems Programmer

Assume responsibility for design and maintenance of our nationwide TP network. Requires minimum 4 years systems programming with heavy TP background. IMS and intercom experience a plus.

Minicomputer Systems Programmer

Responsibilities include selection, implementation and maintenance of a nationwide minicomputer system for remote on-line inquiry, local processing and data entry. Requires 3 years experience in systems design with a background in minicomputer software development. Knowledge of TP software, IBM 370 OS software and experience with COBOL and ALC programming also required. IMS, HASP and Intercom a plus.

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The Academic Services group has a senior-level opening for a programmer analyst to interface directly with faculty doing both research and instructional computing.

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ANALYSTS

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WHEN: Immediate
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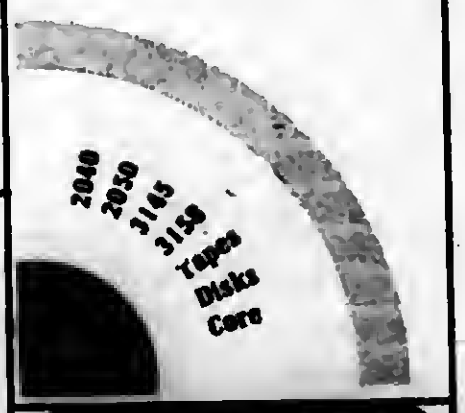
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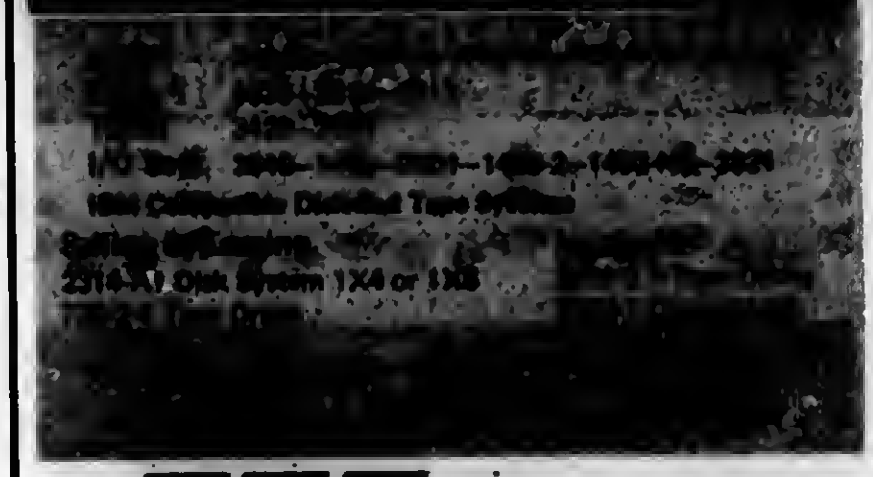
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Communications Firms Report Banner Year

Two communications makers, Milgo Electronics Corp. and Codex Corp., had banner years for the period ended Sept. 30.

Milgo's earnings jumped 56% and Codex had its fifth consecutive record year.

Milgo's revenues for the year rose 31% to $40.4 million compared with $30.8 million last year.

Earnings reached $4.2 million or $2.50 a share compared with $2.7 million or $1.64 a share last year.

The fourth quarter showed earnings rising to $993,246 or 57 cents a share compared with $605,941 or 37 cents a share in the year-ago period.

Revenues for the quarter totaled $10.3 million compared with $8.2 million during the same period last year.

For the year, modem sales totaled $23.5 million; modem leases, $15.1 million; other revenues, $860,000; and other income, $947,000, the firm said.

At Codex, earnings for the year rose to $4.4 million or $3.01 a share from $3.9 million or $2.06 a share last year, when there was a $950,000 tax credit.

Earnings before special credits rose 48%.

Revenues jumped to $26.2 million compared with nearly $18 million in 1974.

For the last quarter of the year, Codex earnings totaled $1.1 million or 68 cents a share compared with $1 million or 70 cents a share in the same period last year.

Quarterly revenues totaled $7.2 million compared with $5.6 million in the year-ago period.

Arthur Carr, Codex president, said the gains in new product announcements, specifically the 6000 series of intelligent network processors, along with the firm's operating lease base, production capability, working capital and net worth support the "further development of Codex Corp. to its planned position as the leading supplier of data communications systems."

Boothe Nine Months Continue Profit

SAN FRANCISCO – Boothe Computer Corp. continued its trend of profitability in the third quarter and nine months and revised its estimates of profits from computer leasing operations.

Over half of the quarter's earnings were from the leasing operations, and the firm now expects to earn profits from this segment of the business through 1978.

Leasing operations accounted for $150,000 of earnings.

For the quarter, Boothe earned $205,000 or 5 cents a share compared with a loss of $1.5 million during the same period last year.

Revenues rose to $12.9 million from $9.7 million in the same 1974 period.

Nine-month earnings totaled $4.2 million or $1.06 a share compared with a loss of nearly $3 million last year.

Most of the 1975 period rise was from the gain from extinguishment of debt which, after a charge in lieu of income taxes, was $3.8 million.

Revenues for the nine months rose to $36.8 million compared with $31.2 million in the same period last year.

As of June 30, Boothe extinguished its debts to Finance-America Corp. of $17 million.

Modcomp Grows In Nine Months

FORT LAUDERDALE, Fla. – Earnings and revenues climbed during the third quarter and nine months at minicomputer-maker Modular Computer Systems, Inc. (Modcomp).

For the quarter, earnings reached $526,000 or 18 cents a share compared with $522,000 or 19 cents a share during the year-ago period.

Revenues rose to $9.5 million compared with $6.8 million in the same 1974 period.

During the nine months, Modcomp earned $1.7 million or 56 cents a share compared with $1.6 million or 62 cents a share in the same period last year.

AUSTRALIA

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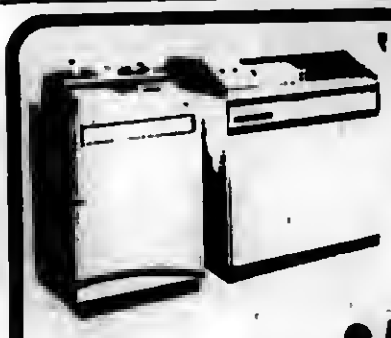
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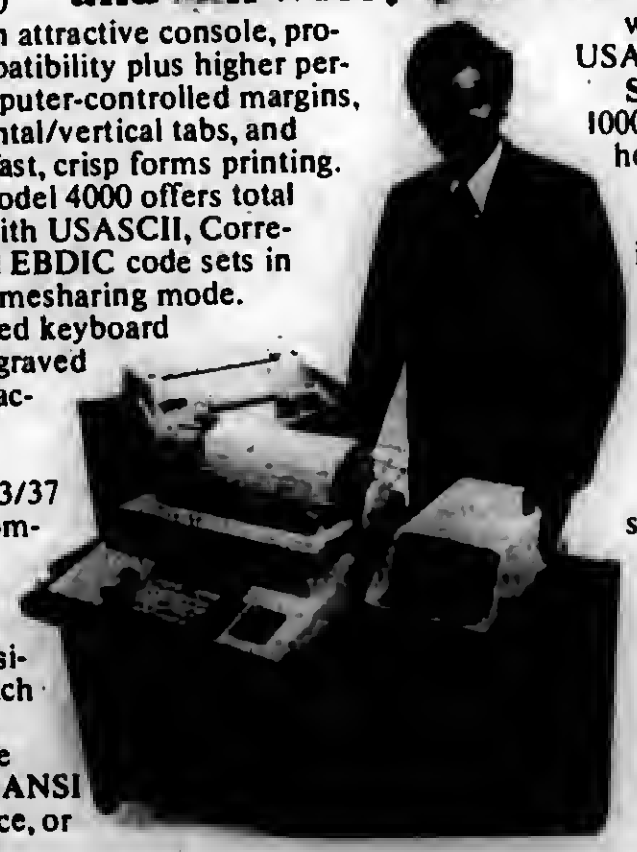
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Three Months Ended Sept. 30

	1975	a1974
Shr Ernd	$.30	$.23
Revenue	14,064,251	11,756,223
Tax Cred	.....	22,000
Earnings	1,173,407	845,738
9 Mo Shr	.91	.65
Revenue	42,058,573	34,352,716
Tax Cred	125,000	143,000
Earnings	3,499,620	2,426,214

a-Restated to reflect United Data Centers acquisition on pooling-of-interests basis.

TRACOR
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.60	.....
Revenue	26,567,000	$24,053,000
Disc Op	.....	(1,004,000)
Spec Item	x742,000	(352,000)
Earnings	1,485,000	(764,000)
9 Mo Shr	1.65	.51
Revenue	75,743,000	68,666,000
Disc Op	.....	(996,000)
Tax Cred	2,025,000	602,000
Earnings	4,066,000	1,254,000

a-Tax-loss carryforward.

BARRY WRIGHT
Three Months Ended Sept. 30

	1975	a1974
Shr Ernd	$.24	$.23
Revenue	9,920,652	10,934,665
Earnings	386,870	372,799
9 Mo Shr	.70	.76
Revenue	31,017,559	33,686,169
Earnings	1,142,514	1,238,989

a-Restated to reflect change to Lifo accounting for about 50% of inventories.

TELEX
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.15	$.02
Revenue	24,935,000	27,355,000
Tax Cred	609,000	.....
Earnings	1,675,000	221,000
6 Mo Shr	.34	.04
Revenue	52,443,000	56,850,000
Tax Cred	1,244,000	.....
Earnings	3,647,000	386,000

TRW
Three Months Ended Sept. 30

	1975 (000)	a1974 (000)
Shr Ernd	$.60	$.70
Revenue	629,800	630,200
Earnings	21,700	25,200
9 Mo Shr	1.87	2.01
Revenue	1,905,700	1,838,700
Earnings	67,400	71,300

a-Restated to reflect Lifo accounting.

MODULAR COMPUTER SYSTEMS
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.18	$.19
Revenue	9,539,000	6,795,000
Earnings	526,000	522,000
9 Mo Shr	.56	.57
Revenue	27,245,000	17,807,000
Tax Cred	.....	188,000
Earnings	1,667,000	1,598,000

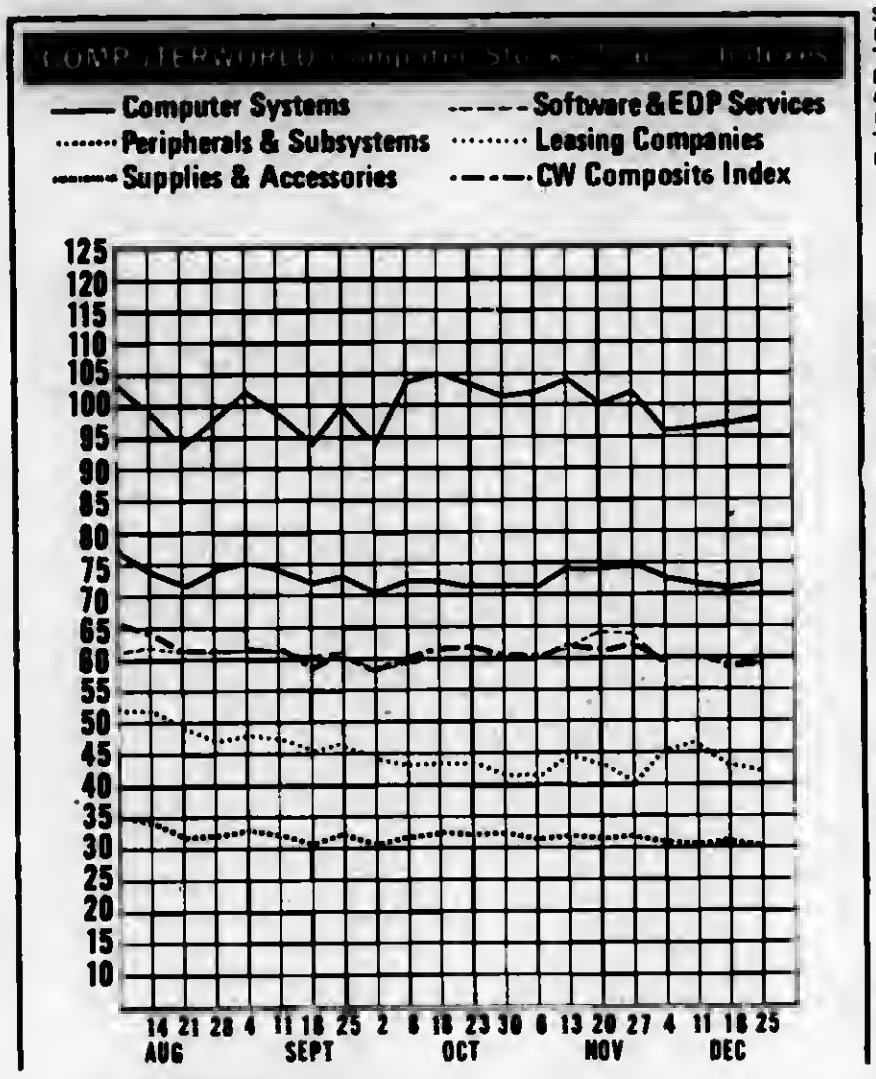
WANGCO
Year Ended Sept. 30

	1975	1974
Shr Ernd	$.90	$1.54
Revenue	20,600,000	18,300,000
Earnings	950,000	1,672,085
3 Mo Shr	.43	.41
Revenue	6,300,000	5,500,000
Earnings	455,000	444,736

WANG LABORATORIES
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.17	$.22
Revenue	18,095,000	a15,754,00
Earnings	682,000	878,000

a-Restated.



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Computerworld Stock Trading Summary

CLOSING PRICES TUESDAY, DECEMBER 23, 1975

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE (1)	CLOSE DEC 23 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	BURROUGHS CORP	62-109	93 1/4	0	0.0
C	COMPUTER AUTOMATION	2- 11	9 3/8	+ 3/8	+4.0
A	CONTROL DATA CORP	11- 23	17 3/4	+ 1/8	+0.7
N	DATA GENERAL CORP	10- 39	36 3/8	0	0.0
O	DATAPOINT CORP	4- 26	21	- 1/4	-1.1
C	DIGITAL COMP CONTROL	1- 4	1 1/2	0	0.0
A	DIGITAL EQUIPMENT	46-140	132 3/8	+2	+1.3
N	ELECTRONIC ASSOC.	2- 8	1 7/8	- 1/8	-9.2
A	ELECTRONIC ENGINEER.	3- 10	7 1/2	+ 1/8	+1.6
N	AMDAHL	23- 42	26 1/4	-1 1/2	-3.4
O	GENERAL AUTOMATION	4- 14	3 1/4	+ 1/8	+2.4
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
R	HEWLETT-PACKARD CO	38-120	93 3/4	-1	-1.0
A	HONEYWELL INC	22- 40	32 1/2	+ 3/8	+1.1
N	IBM	138-226	220	+ 1/4	+0.1
C	PERCEPTRON	1- 10	7	0	0.0
O	MICRODATA CORP	2- 10	9 1/2	0	0.0
E	MODULAR COMPUTER SYS	3- 19	9 3/4	- 1/2	-4.8
N	NCR	13- 39	22 1/8	- 3/8	-2.7
O	PRIME COMPUTER INC	2- 6	3 3/4	- 1/4	-6.2
A	PERKIN-ELMER	16- 30	20 1/2	-2 1/8	-9.3
N	RAYTHEON CO	26- 39	43 3/4	+1	+2.2
N	SINGER COMPANY	9- 17	9 3/4	+ 1/8	+1.2
X	SPERRY RAND	26- 49	39 1/8	+1 3/8	+3.6
A	SYSTEMS ENG. LABS	1- 3	3 1/4	+1	+23.3
P	VARIAN ASSOCIATES	7- 18	11 7/8	0	0.0
N	WANG LABS.	7- 17	9 3/8	- 1/8	-1.2
N	XEROX CORP	47- 84	80 1/8	+2	+4.1
	LEASING COMPANIES				
C	COMDISCO INC	1- 3	3 1/8	- 1/4	-6.6
A	COMMERCE GROUP CORP	2- 4	2 1/4	0	0.0
A	COMPUTER INVESTORS GRP	1- 2	3/8	0	0.0
N	CATRONIC DENTAL	1- 5	5/4	0	0.0
A	DCL INC	0- 1	1/4	-	-20.5
N	DSP INC	3- 6	4 1/2	- 1/8	-2.7
O	EGO RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 3	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 1/2	0	0.0
A	ITEL	3- 9	3 1/2	+ 1/8	+2.3
A	LEASCO CORP	4- 8	3 1/8	- 3/8	-6.3
C	LEASPAC CORP	1- 1	1/4	0	0.0
C	LECTEC MGT INC	1- 1	1/8	0	0.0
O	MAG INC	0- 4	3/8	0	0.0
A	PICKER INTERNATIONAL	2- 7	5 5/8	+ 1/4	+5.1
A	RECOMDOC CORP	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	8 3/4	- 1/4	-3.5

EXCH		1975 RANGE (1)	CLOSE DEC 23 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
C	ADVANCED COMPUTER TECH	1- 1	7/8	- 1/8	-12.5
A	APPLIED DATA RES.	1- 10	1 1/2	- 1/8	-7.6
S	AUTOMATIC DATA PROC	29- 43	33	-1 1/4	-2.3
C	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
C	COMPUTER DIMENSIONS	2- 4	2 7/8	- 1/8	-4.1
C	COMPUTER SYSTEMS	3- 7	8 1/4	+ 1/2	+10.3
E	COMPUTER HORIZONS	1- 1	3/8	- 1/8	-25.0
C	COMPUTER NETWORK	1- 3	1 3/8	0	0.0
A	COMPUTER SCIENCES	2- 6	4 1/8	+ 3/8	+10.0
C	COMPUTER TASK GROUP	1- 1	3/8	0	0.0
C	COMPUTER USAGE	2- 4	3 3/8	+ 1/2	+17.3
C	COMPSHARE	2- 4	2	- 1/8	-5.8
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	11 3/4	+ 3/4	+6.8
C	IMAGINATION INC	1- 1	1/8	0	0.0
C	IPS COMPUTER MARKET.	1- 1	1/2	- 1/8	-20.0
C	KRUSE ASSOCIATES	2- 3	2 1/2	- 1/8	-4.7
C	KEYDATA CORP	2- 4	2 7/8	- 1/8	-4.1
O	LOGICON	3- 3	3 3/8	0	0.0
/	MANAGEMENT DATA	1- 3	1 3/8	0	0.0
/	NATIONAL CSS INC	6- 14	11 3/8	+2	+21.3
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	CR LINE SYSTEMS INC	8- 17	14 1/2	+1 5/8	+12.6
3	PLANNING RESEARCH	2- 6	2 3/4	- 1/8	-4.3
C	PROGRAMMING & SYS	1- 1	1/2	0	0.0
C	RAPIDATA INC	2- 3	3 1/2	- 1/2	-10.3
O	REYNOLDS & REYNOLD	10- 24	13	- 1/2	-3.7
C	SCIENTIFIC COMPUTERS	1- 1	3/8	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/4	0	0.0
C	SYNSHARE INC	7- 21	18 3/8	- 3/8	-2.0
A	URS SYSTEMS	2- 4	3 1/4	- 1/8	-3.7
3	WYLY CORP	2- 4	2 3/8	- 3/8	-13.6
	PERIPHERALS & SUBSYSTEMS				
N	ACCESSOGRAPH-PULT	4- 9	7 1/4	- 1/4	-3.3
O	ADVANCED MEMORY SYS	1- 7	4 1/4	+ 3/8	+9.8
3	ANDEX CORP	3- 7	4 3/8	- 1/8	-0.7
C	ANDERSON JACOBSON	1- 3	1 3/8	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 3	3	- 3/8	-11.1
A	BOLT,BERANEK & NEW	3- 13	8 7/8	0	0.0
N	BURROUGHS-RAMO	4- 8	3 3/4	+ 1/8	+3.4
A	CALCOMP	3- 7	3 3/8	+ 1/8	+3.8
O	CANADIAN DEXCABLES	1- 3	1 7/X	0	0.0
N	CENTRONICS DATA COMP	7- 25	19 3/8	+1 3/8	+7.6
C	COCEX CORP	15- 38	27 1/4	- 3/4	-2.0
C	COGNITRONICS	5- 8	5/8	- 1/8	-16.6
C	COMPUTER COMMUN.	1- 2	7/8	0	0.0
O	COMPUTER CONSOLES	3- 7	4	0	0.0
A	COMPUTER EQUIPMENT	1- 2	1 1/8	0	0.0
C	COMPUTER MACHINERY	1- 8	7/8	- 1/8	-12.5
C	COMPUTEX TRANSCEIVER	1- 2	3/4	0	0.0
C	CONTEX	8- 5	3 1/8	0	0.0
A	CONRAC CORP	62- 98	83 1/4	-3 5/8	-13.4

EXCH		1975 RANGE (1)	CLOSE DEC 23 1975	WEEK NET CHNGE	WEEK PCT CHNGE
C	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	3- 18	6 3/8	-1 3/8	-19.6
A	DATA PRODUCTS CORP	2- 6	4 1/2	+ 7/8	+24.1
O	DATA TECHNOLOGY	1- 3	1 1/8	0	0.0
C	DAYUM INC	1- 2	7/8	0	0.0
O	DECISION DATA COMPUT	2- 7	2 3/8	- 1/4	-9.6
C	DELTA DATA SYSTEMS	1- 1	1/8	0	0.0
O	DIGI COMPUTER	1- 1	3/8	- 1/8	-16.6
M	ELECTRONIC M & M	1- 3	1 1/8	- 1/8	-10.0
C	DATA-TEK	1- 1	3/8	0	0.0
C	GENERAL COMPUTER SYS	1- 2	1 3/4	- 1/4	-12.5
A	HAZELTINE CORP	3- 6	2 7/8	- 1/4	-8.0
N	HARRIS CORP	18- 34	33 3/8	+1 1/4	+3.4
A	INCOTRON CORP	3- 12	8 1/4	+ 1/4	+3.1
C	INFONEX INC	2- 3	2 5/8	- 1/8	-4.5
C	INFORMATICS INTL INC	8- 14	9 7/8	- 1/8	-1.2
A	LUNDY ELECTRONICS	3- 6	4 3/8	- 3/8	-7.3
C	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	MILGO ELECTRONICS	8- 24	13 1/4	+ 1/4	+1.6
A	MOHAWK DATA SCI	1- 3	3 1/8	0	0.0
C	OPTICAL SCANNING	1- 3	1 1/2	0	0.0
C	PEARIL CORP	1- 2	3/4	- 1/4	-25.0
O	SERTEC CORP	2- 8	3 3/8	- 1/2	-12.9
/	SOTTER INSTRUMENT	2- 2	1 3/4	0	0.0
C	PRECISION INST.	1- 1	3/8	0	0.0
C	QUANTOR CORP	2- 6	4	+ 1/8	+3.2
O	RECOGNITION EQUIP	2- 9	6 1/8	0	0.0
N	SANDERS ASSOCIATES	3- 11	6 3/8	+ 3/8	+10.8
O	SCAN DATA	1- 3	2 1/8	+ 3/8	+21.4
C	STORAGE TECHNOLOGY	6- 17	10 1/2	+ 3/8	+3.7
O	SYCOM INC	5- 22	17 1/4	- 3/4	-4.1
O	T BAR INC	3- 6	4	- 1/4	-4.0
C	TALLY CORP.	1- 3	2 1/2	+ 1/4	+11.1
C	TEC INC	1- 4	1 3/4	0	0.0
N	TEKTRONIX INC	18- 43	42 3/4	-1 1/2	-3.3
X	TELEX	1- 3	1 7/8	- 1/8	-6.2
C	WANGCO INC	4- 12	10 1/2	+2 1/8	+23.3
O	WILTEC INC	1- 4	1	0	0.0
	SUPPLIES & ACCESSORIES				
C	BALTIMORE BUS FORMS	4- 8	4 1/4	0	0.0
A	BARRY WRIGHT	3- 9	5 3/8	+ 1/8	+2.3
O	CYBERNATICS INC	0- 5	5/8	0	0.0
A	DATA DOCUMENTS	29- 42	29 3/4	+ 5/8	+1.9
C	DUPLEX PRODUCTS INC	12- 23	17 3/8	+ 7/8	+3.3
A	EDP11 BUS. FORMS	5- 9	8 5/8	0	0.0
C	GRAHAM MAGNETICS	5- 10	9	+ 1/2	+5.9
C	GRAPHIC CONTROLS	8- 21	12	+ 1/4	+2.1
3	3M COMPANY	45- 88	83 3/8	-5 5/8	-3.7
C	MOORE CORP LTD	39- 81	68 1/4	-1 1/4	-2.6
3	NASHUA CORP	9- 28	10 1/2	+1	+10.3
C	STANDARD REGISTER	11- 80	16	- 1/4	-1.5
C	TAB PRODUCTS CO	4- 8	4 1/2	0	0.0
N	UARCO	17- 24	19 7/8	0	0.0
O	WANLEX GRAPHICS CORP	4- 7	4 5/4	0	0.0
/	RAGEON MAGNETICS	3- 5	3 3/8	0	0.0
A	WALLACE BUS FORMS	15- 23	18 1/4	- 1/4	-1.3

EXCH: N=NEW YORK; A=AMEXICAN; P=PHIL-BALT-WASH; L=REGIONAL; R=MIDWESTS; O=OVER-THE-COUNTER
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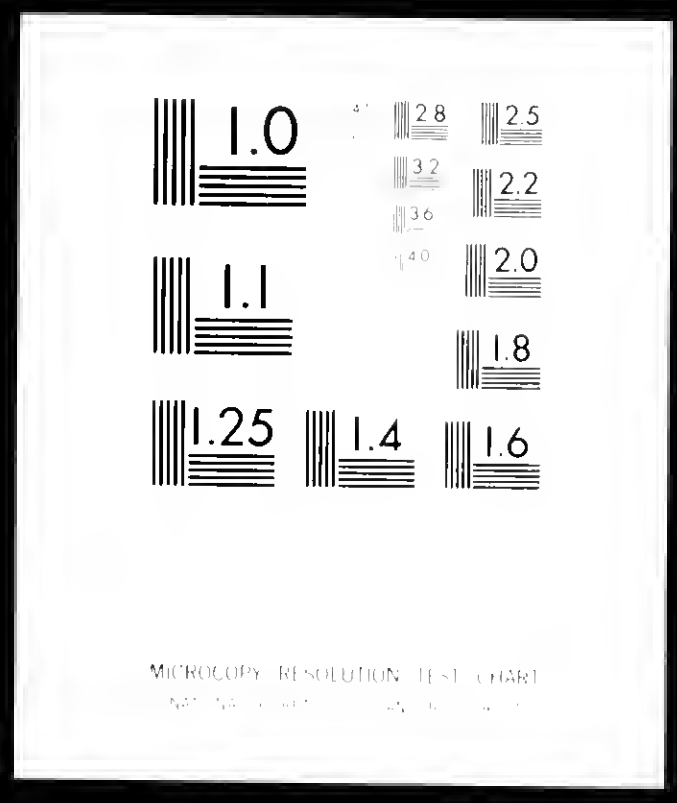
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RESOLUTION CHART



100 MILLIMETERS

INSTRUCTIONS Resolution is expressed in terms of the lines per millimeter recorded by a particular film under specified conditions. Numerals in chart indicate the number of lines per millimeter in adjacent "T-shaped" groupings.

In microfilming, it is necessary to determine the reduction ratio and multiply the number of lines in the chart by this value to find the number of lines recorded by the film. As an aid in determining the reduction ratio, the line above is 100 millimeters in length. Measuring this line in the film image and dividing the length into 100 gives the reduction ratio. Example: the line is 20 mm. long in the film image, and 100 20 5.

Examine "T-shaped" line groupings in the film with microscope, and note the number adjacent to finest lines recorded sharply and distinctly. Multiply this number by the reduction factor to obtain resolving power in lines per millimeter. Example: 7.9 group of lines is clearly recorded while lines in the 10.0 group are not distinctly separated. Reduction ratio is 5, and 7.9 x 5 39.5 lines per millimeter recorded satisfactorily. 10.0 x 5 50 lines per millimeter which are not recorded satisfactorily. Under the particular conditions, maximum resolution is between 39.5 and 50 lines per millimeter.

Resolution, as measured on the film, is a test of the entire photographic system, including lens, exposure, processing, and other factors. These rarely utilize maximum resolution of the film. Vibrations during exposure, lack of critical focus, and exposures yielding very dense negatives are to be avoided.

THE END